

The Iron Age

A Review of the Hardware, Iron and Metal Trades.

Published every Thursday Morning by DAVID WILLIAMS, No. 83 Reade Street, New York. Entered at the Post Office, New York, as Second-Class Matter.

Vol. XXV: No. 1.

New York, Thursday, January 1, 1880.

\$4.50 a Year, Including Postage.
Single Copies, Ten Cents.

Management of Steam in Factories.

It is almost impossible to mention any species of manufacturing which is carried on within doors on a large scale in which steam is not used for a variety of purposes, both winter and summer. The manufacturer is met at every turn by steam consumption. As steam is produced only by the burning of fuel, and as fuel is costly even in the best supplied sections of the country, it becomes necessary to look carefully after both the making and using of steam.

In the vapor of water we find the best possible vehicle for carrying heat, and in the present state of the arts the best means for the conversion of heat into motion. As a heat carrier it leaves little to be desired, since it takes up heat in great quantity and parts with it readily. The laws governing its use are well understood, at least by scientific men, and it would seem as though it possessed every advantage for economical use. It is, however, rare that in factories and machine shops we find anything save the commonest rule of thumb displayed in its management.

We recently took occasion to inspect the new factory of Messrs. Bliss & Williams, Plymouth, Pearl and John sts., Brooklyn, N. Y. The factory, which is just finished and in running order, was designed and erected by their superintendent, Mr. Edmund Jordan, with especial reference to the manufacture of presses and dies of all descriptions. The factory is a large one, having a depth of some 200 feet, and is four stories high. The manufacture of presses and dies is one in which an abundance of light is a great saving. The factory has, therefore, been designed with an unusually small amount of wall and a large amount of window surface. The windows are 4 feet and the piers 3 feet. There are 4380 square feet of glass exposure to the air. On the ground floor the windows are 9 feet high. These circumstances of course necessitate an abundance of heating surface to make the factory comfortable in cold weather. To make the expense of heating as small as possible, unusual pains are necessary, especially in the matter of conveying the steam and returning the drip. While the factory is in many respects a model, it is not in any sense of the word a fancy building. Nothing has been done for show, and a rigid economy has been practiced in all those little details which are usually added for display. On the other hand, where by the expenditure of money the comfort of the workmen or the facility of working could be increased, money has been expended freely and almost lavishly. The limit, in fact, has only been found in reply to the question whether the gain by the improvement would repay the interest upon the investment. So long as the answer has been affirmative, there has been no stint in any direction. In this respect the building and its appointments are a model. The manner in which the generation and consumption of steam in this factory have been accomplished is somewhat peculiar. We have, therefore, had sketches made illustrating the more important features, and shall make them in part the subject of this article.

While discussing upon the general subject of steam in factories, we shall describe specifically the methods employed in this factory, stating some of the reasons which have led the proprietors to depart from beaten paths. While there is undoubtedly much to commend in the plans adopted by the owners of this establishment, it does not follow that considerable modification of them might not be necessary to adapt them to use under different circumstances and in different surroundings. The apparatus here described is exclusively for hard coal, while no small percentage of the manufacturing in the country are situated where soft coal is the only fuel. The principles governing the management of steam, however, remain the same, however the steam may be generated. The arrangement of valves and pipes by which to utilize steam is in no way affected by the method of producing the steam. We believe all, therefore, to whom the use of steam is of any importance, will find much that is of interest and value in the description of the steam fitting of this factory which follows.

The first thing demanding attention in any establishment employing steam is the boiler. This should be of ample size for the work to be done. If too small, it must be crowded in order to produce the necessary amount of steam, and the result is priming and a waste of fuel. On the other hand, an excess of boiler power is not favorable to economy of fuel. In such a case the fires have to be kept so low that they are constantly falling into holes, and the cold is thus admitted to the flues and cools off surfaces which have to be again heated. Large boilers have more radiating surfaces than small ones, and are therefore wasteful when only small quantities of steam are wanted. In naval vessels it is a standing rule, dictated by long experience, that when only half or quarter of a ship's steam power is to be used, it is to be obtained by driving half or quarter of the boilers at their full rate and cutting the others off entirely, and not by running them all with half the usual amount of fuel. Practice in hundreds of different cases, and perhaps thousands, all over the world, has proved that this is true economy. In this the stationary boiler is governed by the same laws as the marine.

From this we see that in selecting a boiler to supply steam to a factory, we

should, as nearly as may be, choose a size whose capacity will give the amount of steam wanted, and neither more nor less.

It is too often the case that, in planning a factory, the whole matter of a boiler is turned over to a boiler maker, who has for directions merely the size of the engine and the amount of space to be heated. Without any unity of purpose in the design, there is little wonder that the results are not such as could be considered satisfactory by those who know what can be done by judicious design and arrangement of details.

In Figs. 1, 2 and 3 we show a longitudinal and cross-section, and a top view of a boiler capable of supplying a very large quantity of steam with a small consumption of fuel. They represent the boiler in the factory above described. At the first glance the experienced eye recognizes a great number of radical departures from the stereotyped methods of boiler setting. The great depth of the fire-box, the large combustion chamber, the short steam dome and the flue covering the top of the boiler, are some of the features that are worthy of attention. The shell is 16 feet long by 54 inches in diameter. It is calculated for a pressure of from 60 to 70 pounds, and has 49 4-inch tubes. The large size of the tubes is favorable, although theory would point out that a greater number of smaller tubes would give much more heating surface. The large tubes, however, are easier to keep clean and are more effective

in the fire-box. On the contrary, the best results are obtained when the greatest quantity of carbonic oxide is made in the furnace itself. This is attained by a great depth of fire. There is, of course, but a small amount of heat generated, and the temperature of the fire is comparatively low, a point which is felt in the wear of the furnace and grate bars. When, however, the gases from the furnace pass the bridge wall they must have the proper supply of air, in order that the carbonic oxide may be completely consumed in the combustion chamber. In this chamber the carbonic oxide meeting and mixing with the air is completely burned, and gives out an intense heat, much greater, in fact, than could be obtained by any practicable method of complete combustion at a single step, as is commonly attempted in practice.

Both front and back connections, B and C, in Fig. 2, by which the gases are turned into and from the tubes, are very thin. That at the back is only 20 inches and the front one 12. The top flue is of good size, extending over the whole top half of the boiler, and is covered with plates having 3-inch flanges, the arrangement of which is shown in Fig. 3. Over the front door is placed a "Fox water arch." This consists of two bars bent into the form shown in Fig. 4, and then covered by plates, top and bottom, so as to leave a passage for water between them. The arch is formed, in fact, of a broad rect-

wires between the principal telegraphic centers, to prevent a recurrence of such a suspension of communication as happened a few days ago.

SCIENTIFIC AND TECHNICAL.

According to the *Electrician*, Mr. Carré makes

CAST IRON MAGNETS

by melting soft metal, very slightly carburized, in crucibles, adding to 15 per cent. of steel filings, and running it into molds. If 1 to 1½ per cent. of nickel be added to the mixture, and 25 to 30-100ths of copper, or 2 per cent. of tin, and 5-100ths of copper, the molded iron can be tempered at a cherry red heat. The best result is obtained, however, by tempering pure cast iron at as high a temperature as the molded pieces will stand without distortion or fracture.

From an article in the *Engineer* it would appear that the

WOOD-CENTERED CAR WHEELS

which are used in very large numbers for the passenger cars of English and Continental railways, have been found unequal to the duty enforced upon them by the higher strains due to the use of continuous brakes. Mr. Cleminson, an English engineer, has sought to render them fit for service under existing circumstances by changing both the construction of the nave and the bars. The

had tumbled both here and in London at the first announcement, gradually rose again, and the clever speculators who had aided in creating the panic, found ample opportunity to place the stocks which they had bought at low figures at a handsome profit.

The public in general, however, after patiently waiting for many months for the wonders to be submitted for approval and adoption, began to lose faith in the man under whose name many false and extravagant rumors and statements had been circulated. The daily press continued to publish, from time to time, distorted and ridiculous interviews between Mr. Edison or his assistants and reporters, but they were received with little interest and much suspicion. Quite recently the matter has again been revived, and the *New York Herald* of December 21 brings a long illustrated history of Mr. Edison's work with electric illumination which deserves attention, aside from any question of success which it may ultimately lead to. As yet no public proof has been given that the appliances devised are actually likely to practically and commercially rival existing systems of illumination, but the history of their development is interesting and characteristic of the man. Edison's earlier experiments were with platinum incandescence lamps, in which the automatic maintenance of the strength of the current below the point of fusion of the metal was obtained by the expansion of a rod of wire surrounded by the luminous spirals. This was followed by a modification, the regulation of the current being effected by the movements of a diaphragm acted upon by gas or air inclosed in a vessel and heated by the proximity of the light. After this came a device for obtaining more light-giving surface, the platinum being wound in the form of a small bobbin, first having been covered with a non-conducting coating that was not injured by the heat.

With this arrangement a new form of regulator was used. The next was a unique idea, making the platinum give the light as it were by proxy. By means of a reflector he concentrated the heat rays of the platinum upon a piece of zircon, causing the latter to become luminous. Mr. Edison then tried the application of the principle of the Geissler tubes without meeting with success. This, it appears, caused him to turn again to incandescence lamps, and it was then that he made his remarkable experiments with the effect of the passage of electric currents of increasing intensity upon platinum in vacuo, in which developed the fact already referred to in *The Iron Age*, that by such treatment the melting point of the metal is very considerably raised. Even this discovery, it appears, failed in the inventor's experience to insure all the elements of success, and we find him turning his attention into new channels. He again returned to carbon as the best material for an incandescence lamp, and found that the most delicate structures, like a charred piece of cotton thread, may serve to produce lights of low candle power. The charred cotton thread or strip of carbonized paper, of horseshoe shape, is inclosed in a little glass globe from which the air is exhausted by means of a vacuum pump and sealed, the wires leading to the dynamo electric machine being attached to each end of the carbon strip or arc. The extreme simplicity of this apparatus and its low cost, certainly meets one of the most important requirements essential to success. How it will stand the test of working beyond the duration of a few days or weeks, and whether it will prove to be able to do what is actually claimed for it, are questions which actual experience and purely authenticated tests alone can prove. Until they have been made we must rest content with admiring Mr. Edison's versatility and his fertility of resource.

Herr Adler has communicated to the Vienna Photographic Society the details of

A NEW COPYING PROCESS.

based upon the use of the gelatine plates employed in the apparatus, like the pectograph already described by us. For writing or drawing Herr Adler uses a concentrated solution of alum, to which, in order to render the writing or drawing visible upon the paper, a few drops of some aniline color is added. Before laying the writing or drawing upon the gelatine surface, pass a damp sponge over the latter, and allow the moisture to sink in for a few minutes, so as to have a greater effect upon the alum. Then lay the written side downward upon the gelatine, and after the lapse of a few minutes, on removing it the writing will be found reversed and eaten into the gelatine film as if it were engraved. By means of an india-rubber roller a little common printing ink is spread over the plate and absorbed by the lines sunk by the alum, and again rejected on the application of moisture upon the paper laid down upon it and smoothed over it by the flat hand. When removed, this paper will have upon it the first impression of the writing or drawing. For each succeeding impression the plate must be inked, as in lithography, by the india-rubber roller. A considerable number of impressions can be taken.

The Cambria Iron Company, of Johnstown, Pa., have just ordered a second Porter-Allen engine, which is to be a duplicate of the 40 inch by 48 inch engine, lately erected at their works, which is driving their steel rail train. The Gautier Steel Company have also ordered a second one of these engines.

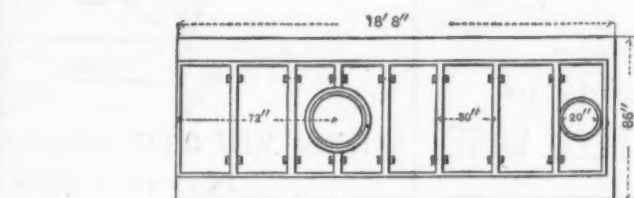


Fig. 1.—Top View of Boiler Setting.

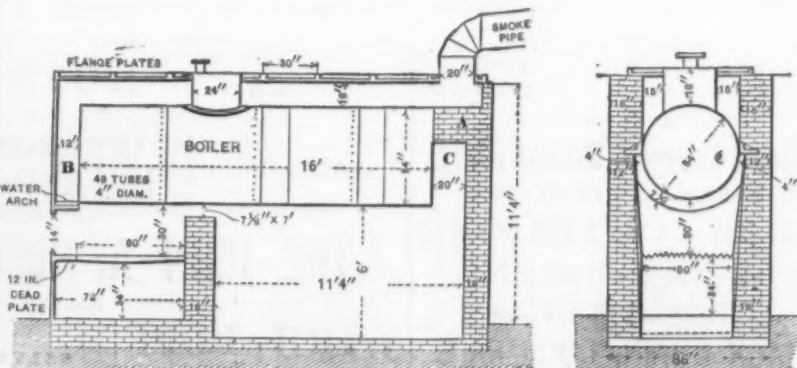


Fig. 2.—Longitudinal Section through Boiler.

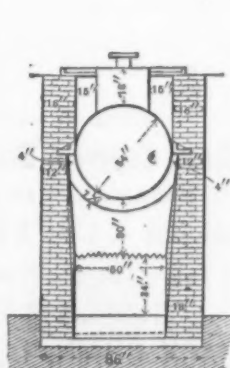


Fig. 3.—Cross Section of Boiler and Setting.

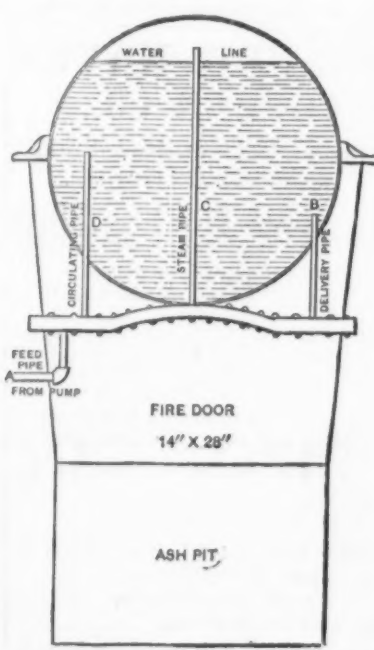


Fig. 4.—Diagram Showing Arrangement of Water Arch and Connections at Front End of Boiler.

MANAGEMENT OF STEAM IN FACTORIES.

tive than smaller ones would be. The steam dome is 2 feet in diameter and 18 inches high. This small size was selected in order to bring the whole of the dome within the return flue over the top of the boiler and leave only the top exposed to loss of heat from radiation. An ordinary steam dome which would, as they are ordinarily made, expose 6 or 7 square feet of surface to the air, would be losing heat continually, while one which, as in this case, is in a hot flue, is constantly receiving heat which would otherwise be wasted. According to tables computed by Messrs. Babcock & Wilcox, the engine builders, the loss would amount to something like 3300 heat units per hour. Although this may seem an unimportant quantity, yet the saving amounts to several dollars per year. In fact, if a boiler was to work constantly 10 hours per day for a year, nearly a ton of coal would be needed to make up for the radiation from the exposed portion of the steam dome alone.

The grate, as will be seen in Fig. 2, is placed 30 inches from the lowest plate of the boiler. To use the common expression, the boiler is "set very high." In practice, a very deep fire is kept, the fuel coming to within 6 inches of the bottom of the boiler. This converts the fire-box into a sort of gas furnace, in which the coal is burned to carbonic oxide instead of to carbonic acid, as is the usual practice.

A thick fire is in direct opposition to the preaching and practice of the boiler makers, boilerusers and steam engineers, but we think that the thick fire can be demonstrated to be the correct and more economical system. It is certainly one which makes it much less difficult for a careless fireman to obtain reasonably good results than it does under the system of thin fires. These need constant and careful attention to prevent them from burning into holes, through which a rush of cold air can take place, or from being so "deadened down" with fuel that the production of steam is stopped for the time being.

A thick fire, with a large combustion chamber behind the bridge wall and a reasonably well-arranged supply of air, in many respects acts, as we have said, like the so-called gas furnaces or "gas producers." There is no attempt made at perfect com-

angular water tube. The water enters one end of this from the feed pipe A, and goes into the boiler through the delivery pipe B, (see Fig. 4). Steam is often made rapidly in the upper part of the arch; and to prevent the water from being driven back in both directions from the crown, which would cause the arch to burn out quickly, a steam pipe, C, is put in, which connects the crown with the steam space of the boiler. In order to make a complete circulation through the arch when the pump is not at work, another connection is made with the boiler by means of the circulating pipe D, through which a constant circulation of water is obtained, in connection with the delivery pipe B under all circumstances, even when the arch is making steam rapidly and the pump is stopped. The feed water usually enters the boiler through the circulating pipe when the fire is the hottest, and an independent circulation goes on through the pipes B and C. The arch prevents the setting from burning out at this point, utilizes the heat, otherwise wasted, and insures hot feed water all the time. It is a source of considerable economy, both in saving of waste and in preventing the rapid wear of the setting.

The ash-pan has a constant supply of water in the bottom, and the radiation from the fire with the dropping of hot coals keeps up a pretty rapid evaporation. This is done for the purpose of keeping the air moist to insure a clean fire, and not from any notion that an economy is obtainable by decomposing the water and then burning the gases thus obtained. Whether this is good practice will be easily determined by experiment.

From the sizes and locations of the flues, it will be observed that every portion of the boiler can be easily reached for inspection without inconvenience. We have had no opportunity of measuring the temperature of the escaping gases from this boiler. That it is low may be inferred from the fact that only 6 feet from the brickwork the smoke-pipe, which is of about No. 10 iron, is so cool that the hand may be laid upon it without discomfort.

(To be continued.)

M. Cochery, French Minister of Posts and Telegraphs, has asked the Chamber of Deputies to vote 8,000,000 francs for subterranean

latter is now made with a number of arms extending to within a short distance of the tire, which do not prevent a close fitting of the wooden segments. He has also improved the ordinary method of tire fastening by having the tire formed with a groove for the retaining ring. The main advantages claimed for wooden centered wheels are a decreased wear of axle and tire, claims which seem to be borne out by comparative experiments made in French and German wheels.

M. Louis Varenne recently examined

THE PASSIVITY OF IRON.

when employed as the positive pole of a nitric acid battery, or as positive electrode of a voltameter cell containing nitric acid, and concludes that the passive state is due to a film of nitric peroxide which collects upon the surface of the iron and protects it from further chemical action. M. Varenne states that this film is apparent when the surface is examined under the microscope. He finds that the passive state ceases if a stream of carbonic dioxide or of hydrogen is passed through the liquid, and that solution proceeds apace. He also finds that nitric peroxide gas is evolved from the passive iron when it is placed in vacuo.

When, about a year since, Prof. Thomas Alva Edison, "the Wizard of Menlo Park, N. J.," was understood to have found the solution of the problem of producing a low-power, cheap electric light, the public was prepared to accept the assertions of those who claimed to speak for him with much faith. He was entitled to more than a respectful hearing, as the man who had invented the quadruple telegraph system, a telephone and the phonograph. The wonderful simplicity of the two latter apparatus, and the remarkable results obtained, were due to originality and daring in invention, which undoubtedly place him in the ranks of the great inventors of this century. Developments in regard to the

EDISON ELECTRIC LIGHT

were, therefore, watched with eager interest, not alone by those directly or indirectly interested financially, but also by the general public. As time passed on, however, the promised revolution in lighting was delayed from week to week; gas stocks, which

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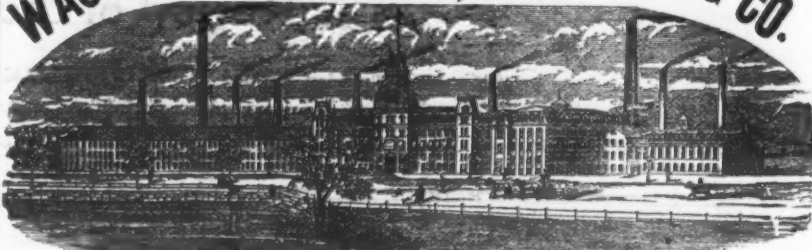
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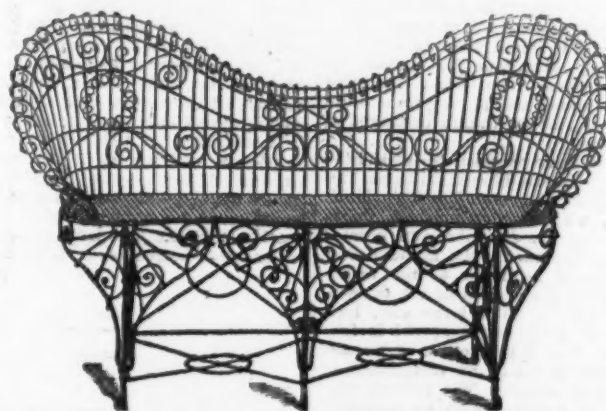
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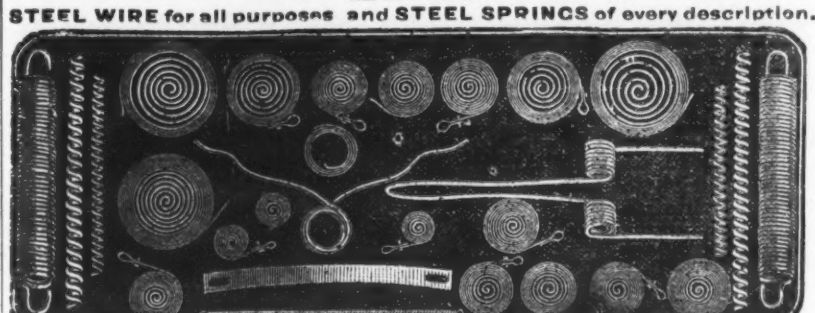
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Hygiene of Occupation.

The hygienic dangers to which workmen and others are exposed in their various employments, are the subject of a recent work of much merit, "Hygiene and Public Health," by Albert H. Buck, M. D., from which we take the following:

It would be impossible to go over the whole ground which an article on this subject should cover, or to give in detail the sources of injury which are in each occupation. A general classification of the employments and their dangers may be made as follows: First, occupations involving the introduction of deleterious matters into the body, either by inhalation or absorption, such as irritating, poisonous or offensive vapors, gases or dust; second, occupations involving exposure to conditions that interfere with nutrition, such as vicissitudes of weather, artificial heat, the over-use of certain organs, constrained attitude or sedentary life; third, occupations involving exposure to mechanical violence, either from machinery, preventable accidents or variations in atmospheric pressure.

Under the first head are included occupations which expose persons to the vapors, gases or fumes of ammonia, sulphurous, hyponitric, nitric, hydrochloric and hydrofluoric acids; the immediate result of which is cough, increased secretion of mucus from the throat and nose, and sometimes lachrymation and sneezing. These attacks ultimately develop into chronic catarrhs, eventually producing bronchitis and emphysema, and occasionally spasmodic asthma. Goldsmiths, silversmiths and jewelers are exposed to the fumes of hyponitric acid, arising from dipping small articles of copper into nitric acid, and in treating the ashes of the sweepings of the shop with mercury, mercurial vapors are generated which endanger poisoning. The galvanic method of gold and silver-plating evolves hydrogen and affects the health of the air of the work-room, and the constant contact with acids and constrained attitude of the body are further dangers. Electrotypers suffer from the same influence as electroplaters. Etchers in metal or glass encounter hyponitric fumes, which may be confined under a glass case and carried off through a shaft connected with the chimney. Bleachers suffer from chlorine gas, but not much. Straw-hat-makers inhale more or less sulphurous acid gas. Manufacturers of chemicals take many irritating substances into their bodies, including nitric, sulphuric, oxalic and picric acids, ammonia and ammonium carbonate, soda, sulphate of quinine and potassium bichromate. If the apparatus in soda factories is imperfect, the workmen are anemic, emaciated, weak, and often have hot, dry skin, diphsia and bronchial catarrh. The emanations given off in the manufacture of the sulphate of quinine produce cutaneous eruptions in certain persons. In the manufacture of potassium bichromate vapors are disengaged which have a peculiar effect upon the nasal mucous membrane of the workmen, resulting in the ultimate loss of the sense of smell; only those who use tobacco or snuff being exempt from the affliction.

THE POISONOUS GASES

which workmen inhale are more or less of carburetted and sulphuretted hydrogen, mercurial, zinc, arsenical and phosphorus fumes, carbon bisulphide, aniline, turpentine and benzine. These substances may enter the body in other ways than by inhalation, as through the skin, being swallowed with food or saliva, or taken up from abraded surfaces. These vapors have a disagreeable and disgusting odor, but are not irritating, and may be taken into the lungs with impunity. Gasmen inhale carburetted and sulphuretted hydrogen when there is a leak, but it is rare for them to be injured thereby. Bronchitis is unknown to them, and they are remarkably exempt from all epidemic diseases. Gilding is still a dangerous trade when the old method of fire-gilding, which is the best, is adhered to, cases of mercury poisoning being frequent. Mirror makers also suffer from mercurial poisoning; women employed at this business are more susceptible than men; the evil results may be prevented by exposing sulphur in the wash rooms to convert the vapors into cinnabar, or by sprinkling the shop with ammonia, or better still, by giving up mercury altogether, and coating the backs of mirrors with silver, which has been proved to be practicable. Brass founders are liable to a disease called "brass founders' ague," caused by the mingled fumes of zinc and copper, and which is sought to be prevented by taking large quantities of milk on melting days to act as a prophylactic. Match-making is one of the worst of the danger-bet trades, for the workmen inhale the emanations of phosphorus. This substance is formed into a paste with chlorate or nitrate of potash, into which the ends of the matches are dipped. The employees are largely women and children with whom the poisoning assumes a chronic form. Lung diseases are not rare among them, gastric catarrh is common, and necrosis or mortification of the jaws is frequent. This latter disease comes in after four or five years of work, and in 11 or 12 out of every hundred persons exposed to the fumes. Phthisis is common to beginners. Match factories should be roomy and well ventilated, and red or amorphous phosphorus should be used, instead of the white commercial article whose employment results in so much danger. Workers in India rubber are exposed to carbon bisulphide vapors, and those who are confined to small, badly ventilated shops, or in cramped rooms at home, as the makers of toy balloons generally are, suffer greatly from headaches, vertigo, anorexia, vomiting and drowsiness. The sight and hearing are impaired, the sexual appetites increase in both sexes, and then diminish, but death has never been observed, the sufferers generally turning to more healthful occupations. Smelters of arsenic and mercury ores suffer from acute poisoning, which result may be avoided by using carefully constructed furnaces, keeping the body clean, and using astringent mouth washes; laborers in the Idria mines consider tobacco chewing a protection against arsenic. Manufacturers of aniline should wear a piece of muslin or sponge, saturated with an alkaline solution, over their mouths to prevent the inhalation of the deleterious vapors which are given

off in the process. Photographers inhale ether from collodion and vertigo results. Cleaners and scourers of cloth inhale benzine and turpentine vapors, which produce caphalgia, lassitude and other nervous disorders.

OFFENSIVE VAPORS.

The occupations which have to do with animal matters and offensive odors do not involve destruction of health. On the contrary, continued exposure to the gases results in increased vigor and robust strength for those who had always been sickly. Persons who suffer from chronic catarrh and lung troubles are often benefited by exposure in oil factories. The workmen suffer less from cholera, and are less apt to succumb to it when attacked than men in other trades. In 1866 not a tanner was taken down when the cholera visited Breslau, and the same exception was noted among manufacturers of night soil into poudrette at Montfaucon, near Paris. Indeed, men engaged in occupations exposing them to offensive odors are, as a rule, strong and healthy, and live longer than the average. Brewers are sometimes dyspeptic and troubled with congestion of the liver. Asphyxia occasionally occurs from the carbonic-acid gas generated in the cellars. Butchers, though robust and florid, are exposed to cold and wet, and suffer from rheumatism, constipation and hemorrhoids. Cutaneous eruptions are not uncommon, and they are liable to furuncles and anthrax. Fellmongers who remove wool from pelts are subjected to the action of lime. Tanners and leather dressers are, as a rule, healthy, but have sores and fissures on their hands, and sometimes, where lime or orpiment is used, arsenical eruptions. In preparing patent leather, lead poisoning may occur. Gut, tripe and head cleaners do not seem to suffer from the damp to which they are exposed, and fat renderers, lard refiners, bone boilers, glue makers, fertilizer makers, pork packers, soap makers, oil pressers and cheese makers appear to be actually benefited by their exposure to offensive gases. Scavengers, including men who clean out cesspools, sewers and privy vaults, inhale carburetted hydrogen and carbonic acid and other gases, but sickness and death are rarely traceable to the prosecution of their trades. Sugar refiners are subject to bronchial and gastric catarrhs on account of the elevated temperature and its sudden variations; also from eruptions caused by handling impure sugar and molasses. Fullers' hands are affected by a skin disease caused by the soda and decomposing urine into which they dip new cloth. Hostlers, cow boys and dog fanciers are liable to take glanders, farcy or hydrophobia by contact with obnoxious animal effluvia. Rag pickers, who handle the sweepings and filth of a community, expose themselves to diseases whose germs may be latent in the bits of cloth, paper, &c., they pick up.

DUST WORKERS

are subject to as great and as dangerous annoyances as those who are exposed to the vapor influences. They inhale particles of dust which are either irritating or poisonous, and phthisis is very common among them, more so than among others belonging to the same social stratum, as has been proved by carefully compiled statistics. In the Allers-Heiligen Hospital at Breslau, from 1859 to 1869, and in the Julius Hospital at Wurzburg, from 1859 to 1865, there were 12,647 who had worked at dusty occupations, of whom 15.3 per cent. had phthisis. Out of 1110 who had not been exposed to dust, only 13.7 per cent. had phthisis. The percentage of cases of phthisis among workmen who inhale dust is as follows:

Metallic Dust—Needle polishers, 69.6; file cutters, 62.2; lithographers, 48.5; sieve makers, 42.1; grinders, 40.4; compositors, 36.9; watchmakers, 36.5; type foundry, 34.9; engravers, 26.3; dyers, 25; varnishers, 25; painters, 24.5; printers, 21.6; belt makers, 19.7; tinkers, 14.1.
Mineral Dust—Flint workers, 80; grindstone makers, 40; stone cutters, 36.4; plasterers, 19; porcelain makers, 16; potters, 14.7; carpenters, 14.4; masons, 12.9; diamond cutters, 9; cement makers, 8.10.

Vegetable Dust—Cigar makers, 36.9; weavers, 15; rope makers, 18.9; millers, 10.9; bakers, 7; chimney sweeps, 6.5; coal miners, 0.8.
Animal Dust—Brush makers, 49.1; hair workers, 32.1; upholsterers, 25.9; fellmongers, 23.2; turners, 16.2; hatters, 15.5; button makers, 10.

Mixed Dust—Glass cutters, 35; glass makers, 17.8; day laborers, 15.1.
No Dust—Shoemakers, 18.7; brewers, 11.2; coopers, 10.1; gloves, 10; tanners, 9.2; butchers, 7.9.

The phthisis which results from dust inhalation differs from phthisis pulmonalis in two important particulars, although its symptoms are similar. It is not hereditary, and if the dangerous occupation be abandoned, recovery often takes place though the disease be far advanced. Besides phthisis, workmen engaged at the trades given above are subject to other ailments peculiar to their respective toils, but this is the most prominent and most dangerous in the case of irritating particles. Where the dust is poisonous, as in preparations of arsenic, mercury and lead, the three metals whose salts are extensively used in the arts, the injurious substances may be introduced into the system in either of three ways: through the alimentary canal, by eating meals in the work room, through the skin, by absorption, and through the respiratory mucous membrane, by inhalation of the dust flying in the air. Where the skin is covered by the poison a local effect is produced, but with this exception these poisons do not inhale, and their influence is first manifested by signs of general intoxication. When this occurs cessation of work is imperative. There is no such thing as acclimatization to wet air, and death follows continued exposure. The dangers attending the manufacture of artificial flowers and colored wall papers, in which arsenical greens are used, are great. Hatters suffer from mercurial poisoning in using the acid metals of mercury to remove hair from skins. Lead-miners, painters, type-founders and enamellers are exposed to lead poisoning. Copperminers are exposed to "copper colic," which is similar to the lead colic.

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2. They should keep face and hands clean.
3. They should never eat in the work-room.
4. No women or children should be employed in dangerous occupations.

CERTAIN OCCUPATIONS

involve exposures to conditions that interfere with nutrition. These conditions may arise from an abnormally high temperature, the strain or over-use of certain organs, and a constrained attitude. Boatmen, fishermen, farmers, teamsters, and laborers exposed to alternations of heat and cold are liable to acute pulmonary affections and rheumatism. Bakers and cooks who are exposed to great heat have pale, puffy faces, and are subject to rheumatism, varicose veins and hernia. Bakers are less healthy than coopers. During the Marseilles plague in 1720 all the bakers died and neighboring towns had to supply bread. Clot Bey noticed the same excess in mortality among them in epidemics of yellow fever, cholera and typhus in the East. Brick-makers have painful crepitations of the tendons of the wrist, due to synovitis. Charcoal burners are unaffected when their work is done in the open air, but are somewhat subject to hemeralopia or night blindness. Blacksmiths are commonly affected with chronic bronchial catarrh, affections of the eyes, intense headaches and rheumatism. Engineers and stokers are an unhealthy class, subject to catarrh, rheumatism and pneumonia, and frequently die of phthisis. Iron-puddlers, glass-blowers, &c., are open to disease consequent in change of temperature. Laundresses are apt to be anemic, and dyers, being exposed to damp, contract catarrhs and rheumatism, and have cutaneous complaints.

The over-use or abuse of the nervous system is not only a source of danger, but of suffering. Stimulants may overcome exhaustion for a time, but this artificial strength cannot last long, and the constitution and mind go down at last in complete wreck. Brokers, merchants and gamblers come under this category, the last named adding irregular hours and night work to their other dangers. Moderation in work and worry is the only advice to be given to such men. Physicians experience much mental suffering—are besides subject to contagious diseases. Tea-tasters seldom last more than seven or eight years, their occupation breaking down the nervous system in that time. Where the eyes are over-used or exposed to artificial light in scrutinizing minute objects, dimness of vision results and severe neuralgia. Engravers, lapidaries, watchmakers and seamstresses are particularly subject to optical affections, and their sedentary life also tells against them. Actors, clergymen, public singers and public speakers strain their vocal organs, and follicular pharyngitis, known as "clergyman's sore throat," is produced. Athletes, prize-fighters, gymnasts, wrestlers, &c., undergo tremendous muscular exertion at intervals, and are usually short-lived. Many of them have emphysema and hypertrophy of the heart, and a large proportion die of phthisis. Printers, including pressmen and compositors, are generally pale and unhealthy, and frequently suffer from dyspepsia, diarrhoea, bronchial catarrh and phthisis. Coopers, owing to the moisture of their rooms, are also liable to bronchial and intestinal catarrh, rheumatism and sciatica. Carpenters and cabinet-makers have varicose veins in the lower limbs. Tailors and shoemakers, who belong to what are called the contemplative trades, work under bad hygienic conditions, and constipation and hemorrhoids are frequent among them; the pressure of the last on the breast produces depression of the thorax, and the skin of the thigh is flattened by the lapstone; the solitariness of their work leads them to meditation, and occasionally produces great thinkers like Jacob Bohme, Johan Von Layden and Hans Sachs; the meistersingers of the Middle Ages were principally from the contemplative trades.

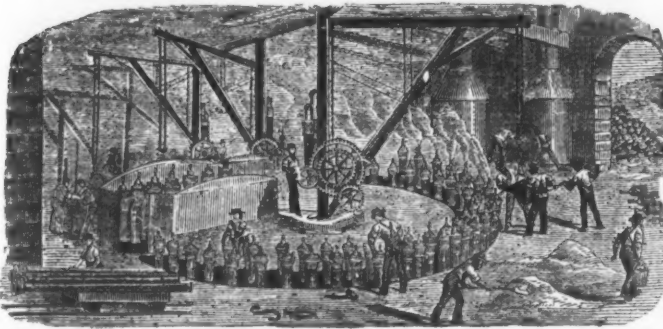
SEDENTARY LIFE,

such as is led by artists, clerks, lawyers, literary men, students and teachers, induces all the evils that flow from too much devotion to cerebral activity at the expense of other organs. Brain vigor is undoubtedly increased, but the vegetable functions of the body become less regular and less certain. Trouble begins in the digestive apparatus. Digestion is slow, with eructations and uneasiness in the epigastric regions. The bowels are constipated. Many become dyspeptics. Debility leads to the use of tea, coffee, alcohol or opium for stimulation—practices which break down health, and are not easily shaken off. Literary men in particular are apt to become insane. Even if not actual lunatics, so as to require the constant care of friends, they often suffer from hallucinations and fits of melancholy, which indicate nutritive disturbances in the brain. These symptoms are frequently the result of hereditary tendencies, but their development is hastened and expanded by their mode of life. A comparatively large proportion of men of sedentary lives suffer from urinary difficulties—generally gravel—as they grow old, and many of them finally die of apoplexy. The proper mode of life for persons of sedentary habits would, of course, involve a more suitable apportionment of hours for bodily and mental exercise. The impairment of the sight should be guarded against by the correction of errors of refraction or accommodation where they exist, and the shading of the eyes and use of tinted glasses when working by artificial light.

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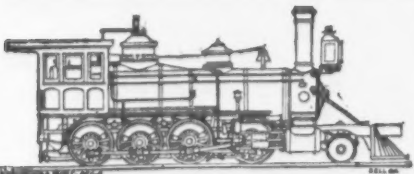
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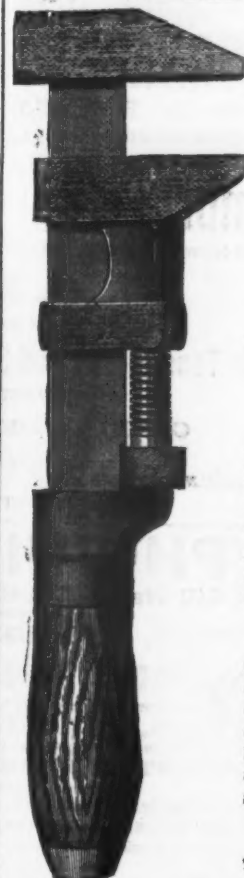
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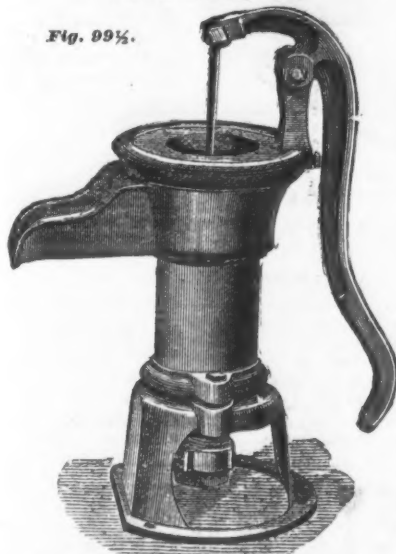
Retail Yard on D. L. & W. Railroad, cor. Grove and 18th sts., Jersey City. Coal delivered direct from shutes to carts and wagons. Families and manufacturers supplied with the best quality of Coal at the lowest rates.

Office: At yard cor. Grove and 18th sts., 1000 Bay st. and Newark av., Jersey City; Room 31, 111 Broadway, N. Y. General Office, Bank Building, cor. Newark and Hudson sts., Hoboken. P. O. Box 247, Hoboken.

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The Largest Pump Works in the World.
OVER 800 DIFFERENT STYLES.
**PUMPS, STEAM PUMPS, ROTARY
PUMPS, CENTRIFUGAL PUMPS,
PISTON PUMPS,**
for Tanners, Paper Mills, Fire Purposes, suitable for
all situations imaginable.

Fig. 99 1/2.



Also, HAND FIRE ENGINES.
Send for Catalogue. Address
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Seneca Falls, N. Y., U. S. A.

BRANCH HOUSES: 93 Liberty St., New York, and
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GEORGETOWN, CONN.,
MANUFACTURERS OF

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WIRE CLOTH,**

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GILBERT'S RIVAL ASH SIEVE,
Galvanized Twist Wire Netting,
THE UNION METALLIC CLOTHES LINE WIRE,
Warehouse, - 42 Cliff St., New York.



John Maxheimer,
Manufacturer of
Patented
Japanned, Tinned
Wire,
First and Second-
Class Brass
Bird Cages.
Wires on both classes
fastened without solder.
The cheapest and most
saleable in market.
947 & 949 Pearl St.,
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Representing in the Dominion of Canada several
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All kinds Wagon & Carriage Axles
Manufactured by the
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IN THE WORLD.

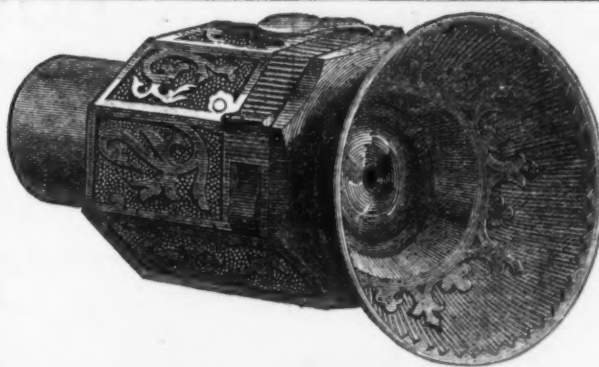
Awarded the **GRAND MEDAL** at
WORLD'S EXPOSITION, Paris,
France, 1876, being the highest award on
Pumps, &c.; also the highest medals at
Paris, 1867, Vienna, 1873, and Philadelphia,
1876, accompanied by the Report of Judges.

Descriptive Catalogues and Price Lists
sent when requested.

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PATENT
ELLIPTIC Spring Whistles



FOR
SPEAKING TUBES.
Patented April 14th 1876.

We call the attention of the trade to the whistle for speaking tubes, represented in above cut, as
being superior, in a mechanical point of view, on account of the

PATENT ELLIPTIC SPRING,

which is much less liable to break and get out of order than the spiral spring usually used. These
whistles being made entirely of metal, are very strong and durable. They are offered in a variety of
styles at very reasonable prices. Send for illustrated circular and quotations.
We also invite an examination of our **PATENT REVERSIBLE DOOR LOCKS**, which
by their peculiar construction, combine simplicity, strength and durability. In these Locks
the combination of the Patent Lever and Spring renders the latch movement very easy and prompt in
action.

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Manufacturers of Superior Building Hardware.

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AGENTS.

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Cigar-Box Nails, Basket Nails, 2d and 3d Fine Nails.
Carpet Tacks, Upholsterers' Tacks, Gimp and Lace Tacks,
Brush Tacks, Copper and Brass Tacks,
BRASS AND IRON ESCUTCHEON PINS, &c., &c.,
MANUFACTURED BY
DUNBAR, HOBART & WHIDDEN, So. Abington Station, Mass.
New York Salesroom, 39 Warren St. Goods made to order from sample.
Particular attention given to orders for EXPORT.

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HOG RINGER
RINGS AND HOLDER.**
Only double Ring ever
invented. The only
Ring that will effec-
tually keep Hogs from
rooting. No sharp
points in the nose.



**EAGLE BILL
CORN HUSKER**
is the best Husker in the
market. Farmers say it
is the best. Use no other.

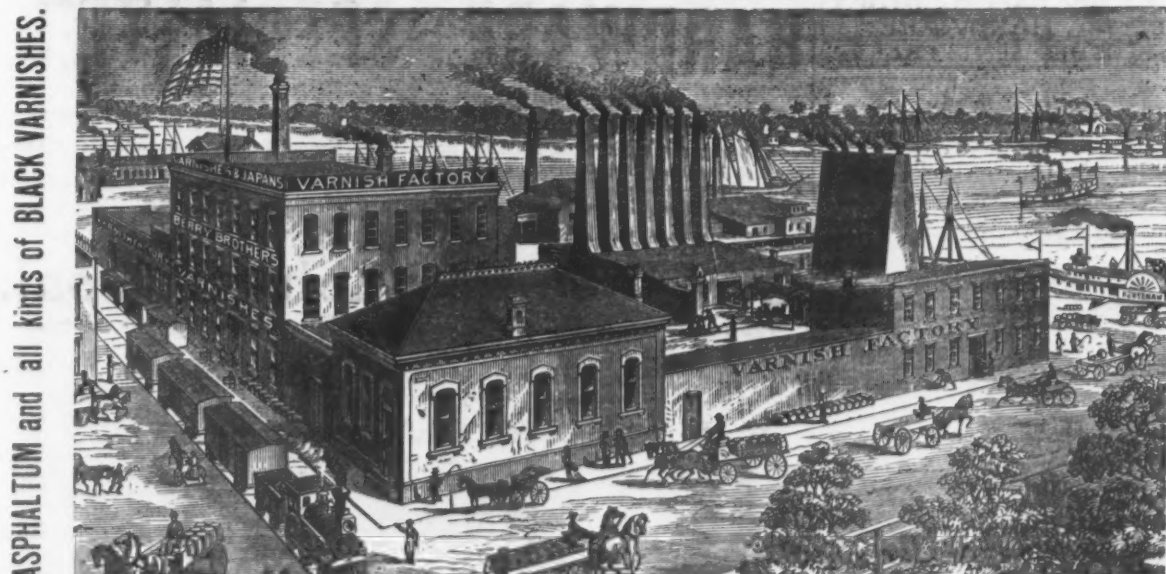


**BROWN'S
HOG AND PIG
RINGER AND RINGS.**
Only single Ring in
the market that closes
on the outside of the
nose. No sharp points
in the nose to keep it
sore.

Ringers, 75c. Rings, 50c. 100. Holders, 75c. Huskers, 10c.
CHAMBERS, BERING & QUINLAN, Exclusive Manufacturers, Decatur, Ill.

ESTABLISHED 1858.

BLACK and BROWN BAKING JAPANS.



BERRY BROTHERS, Varnish Manufacturers, Detroit, Mich.
CHICAGO BRANCH, 236 Lake St.; ST. LOUIS, 303 & 305 North Third St.; CINCINNATI, 72 Main St.; ROCHESTER, 116 Front St.; BALTIMORE, 100
West Lombard St.; PHILADELPHIA, 57 North Front St.; BOSTON, 141 Milk St.; NEW YORK, 275 Broadway.

derating number were literary men. Thus,
out of 380 male asthenopes there were 154
students, 34 clerks, 29 lawyers, 18 book-
keepers, 6 teachers, 3 writers and 3 editors;
and of 142 female asthenopes there were 16
students, 19 teachers and 2 writers.

THE AVERAGE AGE

to which men of different occupations live is
shown by statistics to be as follows: Agate
polishers, 45-48 years; blacksmiths, 55.1;
bone boilers, &c., 64; brass founders, 60.4;
brass workers, 52.2; brewers, 50.6; britan-
nia workers, 42.2; buckram makers, 63.1;
butchers, 56.5; cabinet makers, 49.8; car-
penters, 55.7; catgut makers, 60-62; ce-
ment makers, 50; chimney sweeps, 45.3;
cloth weavers, 57.5-59; workers in coal,
55.1; confectioners, 57.1; coppersmiths,
48.6; cotton operatives, 47-50; diamond
cutters, 37-72; dyers, 63.7; engravers,
54.6; fellmongers, 50.5; fertilizer makers,
51; file cutters, 54; fullers, 60.5; gasmen,
62-65; gilders, 53.8; glass cutters, 42.5;
glass makers, 57.3; goldsmiths, 44; workers
in gold, 50.3; grave diggers, 58-60; workers
in gum, 57; hatters, 51.6; laborers in arsenic
mines, 47; laborers at artificial flowers,
40; laborers in bleaching works, 52-53; in
color works, 48.7; copper forgers, 60.5;
day laborers, 52.4; lead miners, 41; la-
borers in lead smelting works, 41; laborers
in distilleries, 63.5; laborers in quicksilver
mines, 52; laborers in silver smelting works,
42.5; laborers in sugar of lead works, 45;
locksmiths, 49.1; machinists and stokers on
railroads, 35; machinists and stokers on
steamships, 57; workers in madder, 60;
masons, 55.6; millers, 45.1; mirror makers
(male), 48.6; mirror makers (female), 36.2;
needle polishers, 50; workers in oil, 64;
painters, 57; paper makers, 37.6; workers
in paraffine, 60-62; porcelain makers, 42.5;
porcelain turners, 38; potters, 53.1; prin-
ters, 54.3; railroad employees, 39.7; refiners,
70; rope makers, 42-45; saddlers, 53.5; salt
boilers, 67; workers in salt, 74; workers in
sandstone, 45; scavengers, 58-60; workers
in turpentine, 62 3/4; slate makers, 50.4;
slate quarries, 64-67; stone cutters, 36.3;
tanners, 61.2; workers in tar, 60-62; tink-
ers, 47.7; workers in tobacco, 58.3; turners,
57.4; varnishers, 45; vino dressers, 52.7;
watchmakers, 55.9; weavers, 51.9; well
diggers, 58.3; wigmakers, 57.9; wine makers,
52.7.

Reducing Friction.

The following short sermon upon friction
we find in one of our exchanges. It has
many sensible suggestions and much good
advice. There are hints in regard to fric-
tion that will be found valuable in the tin
shop as well as in the factory, for there is
hardly a shop in the country where ma-
chinery of some kind is not used and where
unnecessary friction is not wasting power:
"It is not work, but friction, which wears
out machinery. It should be, therefore, the
prime object of every mechanic to lessen the
friction of all bearings as much as possible
by the application of carefully selected
lubricants. There are three circumstances
which should guide us in making a selection
of a lubricant of proper character. First,
the character of the work to be done; for
example, if it is light or heavy, as a very
different lubricant is needed for heavy
shafting from that of light. Second, the
character of the surfaces; thus, if the same
lubricant was used for fine steel journals
running in metal boxes as for cast-iron jour-
nals running in a wooden box, there would
be a great mistake made by the mechanic so
using it. Cast iron or coarse wrought iron
working on cast iron requires a very differ-
ent lubricant from that used to the best ad-
vantage on hard and finely polished steel
running in brass or hard gun metal, and yet
this mistake has been made over and over
again. It is not an uncommon thing to see
fine oil, such as is used on the finest ma-
chinery, applied to cast-iron bearings and
journals on the erroneous principle that what
is dearest is best. Third, the temperature
under which the machinery works must be
taken into consideration. If the piece of
machinery should be exposed to the weather,
like over or under shot water wheels, a dif-
ferent lubricant should be used in cold and
in warm weather. Great attention is paid
to this in England, where the temperature
of the weather is more uniform than it is
here; there should be more attention paid
here, where the extremes of temperature
are greater. Where journals run in a highly
heated atmosphere great difficulty is ex-
perienced, and in most cases we depend on
plumbago or some similar body. Plumbago,
properly prepared and applied, forms a very
good lubricant for such purposes.
It is necessary, however, to use a much
harder substance or lubricant where the
machinery is heavy and the bearing surfaces
press against each other with greater force
than would be admissible under opposite cir-
cumstances. When the bearing surfaces are
soft and porous, like wood and cast iron, it
will be found advantageous to use a hard lu-
bricator.
Different degrees of hardness or softness
may be obtained by mixing the various lu-
bricators in use; for instance, by mixing oil
or tallow with soda or potash different
degrees may be obtained, soda giving a
hard, and soda and potash a soft one. Gly-
cerine is an excellent lubricant for fine ma-
chinery.
A little alkali renders oil or fat much less
susceptible to the action of moderate heat, as
the heat of the weather, but destroys its
utility as a lubricator for very hot bearings.
When tallow is mixed with a little plumbago,
the latter forms a very fine coating on the sur-
face, and diminishes the friction consider-
ably. This is a good way to apply plumbago,
although it is frequently used with soap, and
sometimes used dry. Soft and porous cast-
iron surfaces cannot receive a better lubri-
cant than plumbago, but it must be of the
very best quality, with no adulteration what-
ever.
The relations of lubricants to air and iron
dust are important features in their char-
acters. Some oils gum up or dry very rap-
idly on exposure to air, and in some this ac-
tion is greatly increased by the presence of
the minute particles of iron that are scraped
off by the friction of the moving surfaces,
and all oils should be carefully purified from
matter that tends to increase this quality.

Soaps form very good lubricants for
wooden bearings, upon which it is very
often a waste of material to put oil. Tallow
is vastly better for such places, and paraf-
fine even better yet. Soft soap mixed with
tar is very good for greasing heavy timbers,
which have to slide inward and carry large
weights, as in moving houses and the like.
Castor oil is another lubricating material
which, though expensive, is cheaper in the
end than many low-priced oils. It is good
on small machinery, like hand presses and
hand machines.

Co-operative Coal Digging.

Just at this time, when the breach be-
tween operators and miners seems widened
rather than healed by arbitration, it is of
interest to make public the existence of a
plan that has been in operation at extensive
coal works for years, and that has resulted
in contented miners and operators, steady
work and a generally satisfactory state of
affairs all round.

The firm of Corey & Co. operate the
Waverly Coal Company's enterprise at
Smithton Station, on the Baltimore and
Ohio Road, and the works of Corey & Co.,
at Braddock, on the Pennsylvania Railroad.
Both are conducted on the co-operative prin-
ciple, which makes each miner virtually a
partner in the concern, holding him liable
for losses and giving him a show in all
profits. At Braddock there are 50 men in
the pits, the average output being 5000
bushels per day. Each man in the employ-
ment of the firm signs an agreement to the
following effect: The price paid for mining
is based on the selling price of coal "on the
wall" (Union Depot) at this city. The scale
runs down to 5 cents per bushel, and has
the following provisions:

When coal is	Mining is
5 cents per bushel	\$2.00 per 100 bushels.
5 1/4 cents per bushel	2.30 per 100 bushels.
5 1/2 cents per bushel	2.60 per 100 bushels.
6 cents per bushel	And so on.

The agreement further stipulates that no
coal shall be sold below the lowest point
named in the scale without the consent of
both operator and miner. Also, that no
change whatever in this scale shall be
effected by either side without 60 days' no-
tice. At the end of each month the average
of the month's rates is found and the miners
are paid in strict accordance therewith, and
on the basis given. The books are at all
times open to the inspection of those of the
men who desire to satisfy themselves by
such an inspection.

At the Waverly Works the same prin-
ciples of co-operation are carried out, but
the coal not being sold "on the wall," freight is
deducted and the miners get one-half the
net price obtained at the mines, and also 25
cents per wagon for slack. In addition,
three prizes are offered their miners by
the firm, to those of the former who can
show the largest earnings during the year.
This novel plan of giving money to the
man who makes the most, is an incentive
for steady labor, and has been found to
work well. The first prize is \$100, second
\$50 and third \$25. For ten years this plan
of co-operative labor has been pursued by
the firm named, and it does not seem that
either side finds anything to regret in
adopting the means enumerated. There has
been no such thing as a strike in either pit
during the time named. Many of the firm's
employees have become possessed of com-
fortable homes, besides having money laid
up for the rainy days that are sure to come.
During the trying times of riot, hard times,
&c., no disturber has been found eloquent
enough to coax the miners out of the pits
named, and altogether it seems that co-opera-
tion is infinitely better than arbitration.

Coloring Brasswork.—Cleaned-up brass-
work, if left in damp sand, acquires a fine
brown color, which, when polished with a
dry brush, remains permanent and requires
little cleaning. A green and light coating
of verdigris on the surface of the brass may
be made by means of dilute acids, allowed
to dry spontaneously. The processes are,
however, slow, and quicker means have
to be adopted. Before bronzing, the brass
is annealed, pickled in old or dilute nitric
acid, till the scales can be removed from the
surface, scoured with sand and water, and
dried. Bronzing is then performed accord-
ing to the color desired. A steel-gray color
is deposited on brass from a dilute boiling
solution of chloride of arsenic; and a blue,
by careful treatment with strong hydrosul-
phate of soda. Black, much used for optical
brasswork, is obtained by coating the brass
with a solution of platinum, or with chloride
of gold mixed with nitrate of tin. The
Japanese are said to bronze their brass by
boiling it in a solution of sulphate of copper,
alum and verdigris. Success in bronzing
greatly depends on the temperature of the
brass or of the solution, the proportions of
the metals used in forming the alloy and
the quality of the materials; the moment at
which to withdraw the goods, and the dry-
ing, require attention.

Iron Barges for Grain and Coal.—The
Pittsburgh Telegraph states that the Fort
Pitt Boiler Works have been applied to for
figures on an indefinite number of iron
barges suited to the transportation of grain.
No definite inquiry for proposals to build has
been received as yet, but matters tend that
way. Meanwhile, the establishment named
will begin the construction of a pair of ex-
perimental iron barges for coal transporta-
tion, and constructed under patents recently
secured by Mr. R. G. Jones, one of the firm.
These barges will be respectively 130 and
140 feet in length by 25 feet beam and 7 1/2
feet hold. The plates will be 1/2 or 5-16ths
inch thick, and the patent named covers the
use of wood to a limited extent. Wooden
sill timbers and bottom planks form part of
the craft, and to render the joints water-
tight, rubber gaskets will be interposed be-
tween the angle iron and the sill. The cost
of the iron barge at present prices of the
metal, and as compared with the cost of
wood, is nearly double, but the advantages
claimed in the way of increased duration and
strength will, it is thought, counterbalance
the increased first cost of the barges.

ASPHALTUM and all kinds of BLACK VARNISHES.

COACH, CAR and FURNITURE VARNISHES.

AUBURN FILE WORKS,
Superior Hand-Cut
FILES AND RASPS,
MADE FROM IMPORTED STEEL. EVERY FILE WARRANTED.
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McCAFFREY & BRO.,
PENNSYLVANIA FILE WORKS,
Philadelphia, Pa., U. S.



Manufacture and keep in stock a full line of **FILES** and **RASPS** only, for which we claim special advantages over the ordinary goods, and ask domestic and foreign buyers to allow us to compete for their trade.
Superiority acknowledged wherever used, sold or exhibited.

SNELL MANUFACTURING COMPANY,



FISKDALE, MASS.,
TENNIS & WILSON,
Sole Agents,
82 Reade St., New York,
MANUFACTURERS OF



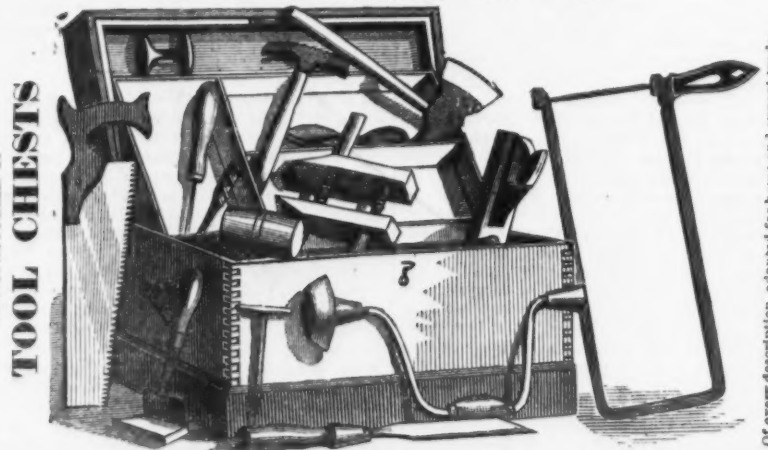
Angular and Upright Boring Machines, Boring Machine Augers, Solid Cast-Steel Carpenters' Augers, Extra Cast-Steel Auger Bits, Jennings' Pattern Auger Bits, Car Bits, 9 and 12-inch Twist, Phoenix Superior Cast-Steel Auger Bits, Screw-Drive Bits, Taper Pod Gimlets, Taper Pod Gimlet Bits, Countersink Gimlet Bits, Long Millwright Solid Cast-Steel Augers, Long Rafting Solid Cast-Steel Augers, Coopers' Dowelling Bits and Boat-Builders' Bits, And all kinds of Machine Bits made to order.

TENNIS & WILSON,
Manufacturers and Jobbers of Hardware,
80 & 82 READE STREET, NEW YORK.
SOLE AGENTS FOR

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H. Clark's Cast Steel Claw, Lath and Shingling Hatchets.
T. & W. Hand-Forced Screw Drivers.
Sashum Lock Co. Locks, Knobs, &c.
Taylor Mfg. Co. Bells, Wed's Molasses Gater, &c.
Parker & Norris Anvils and Chain Vises.
W. Hunt & Co. Genuine Turkey Razor Straps.
Wellington Mills. Patent Corn Popper.
Bromwell Mfg. Co. Patent Nut Cracker.

DEPOT FOR
Davis' Inclino-meters, Patent Levels and Iron Planes.
Holden's Files.
Woolson's Wood Mouse Traps.
Bemis & Call's Patent Wrenches, Calipers, Dividers.
Clark's Axes and Hatchets.
Lincoln's Molasses Gater.
Aiken's Saw Sets and Awls and Tools.
Leach's Saw Sets.
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WELL MADE.
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Common Mouse Traps, Porcelain Lined Lemon Squeezers, Mallets, Rosewood Faucets, Steak Hammers and Housefurnishing Ware.

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THE WHITE MOUNTAIN FREEZER COMPANY are headquarters for Ice Cream Freezers and Ice Crushers, being the only firm in the United States who manufacture all parts of the raw material. The Examining Committee, consisting of 50,000 citizens of the United States have recom-



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HAND OR POWER, 25 and 50 qts. \$75.00 and \$175.00
HAND OR POWER, ICE CRUSHER, \$75.00

White Mountain Freezer Co.,
Laconia, N. H., U. S. A.

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FILES & RASPS,
Best Cast Steel.
HAND-CUT. Manufactured by
JOHNSON & BRO.
No. 1 Commercial Street, Newark, N. J.

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Rail Screws, Stove and Tire Bolts, Rivets, &c.
O. Ames & Sons, Shovels, Spades and Scoops.
A. Field & Son, Tacks, Brads, Nails, &c.
G. F. Warner & Co., Carriage Clamps.
We have also on hand a general assortment of Hardware

Established 1868.



THE GIANT PAD LOCK.
Manufactured by
THE SMITH & EGGE MFG. CO.
(Centennial Award.)

"Superior in Every Respect."
This is one of the best selling Locks in the market, and affords the dealer a large profit. It is thoroughly and strongly made—of the best material—very handsome in appearance, and every Lock is warranted. Orders solicited. Address as above.
Lock Box 105, Bridgeport, Conn.

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Exhibitions of 1862, 1865, 1867, 1872, 1873, and only award and medal for Noiseless Steel Shutters at Philadelphia, 1876, and Paris, 1878.

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Noiseless Self-Coiling Revolving STEEL SHUTTERS,

FIRE AND BURGLAR PROOF.
ALSO IMPROVED

Rolling Wood Shutters

Of various kinds. Endorsed by the Leading Architects of the World.
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Washington, D. C.

H. HOWSON, Solicitor of Patents, C. HOWSON, Attorney at Law.
Communications should be addressed to the
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PATENTS.

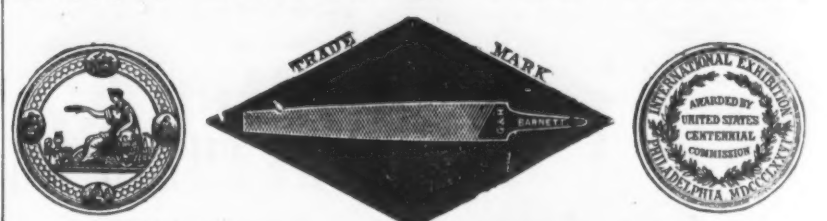
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Annual production 180,000 sets.

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Warranted CAST STEEL.
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Kloman, Park & Co., Vises, Picks, Mattocks, Grub Hoes, &c.
Jacobus & Nimick Mfg. Co., Locks, &c.
Sandusky Tool Co., Planes and Plane Cons.
Geo. M. Eddy & Co., Measuring Tapes.
Wheeling Hinge Co., Hinges and Wrought Butts.
Northwestern Horse Nail Co., Horse Nails.
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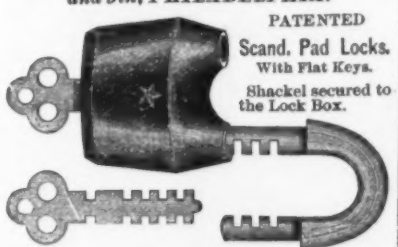
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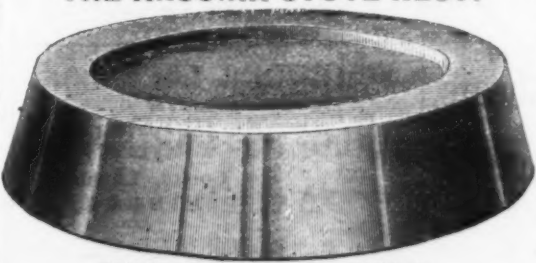
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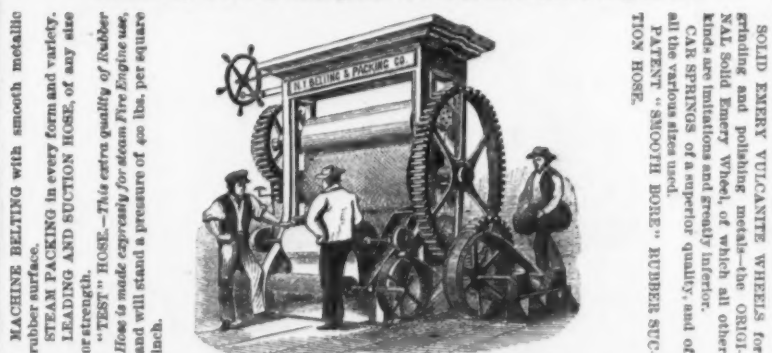
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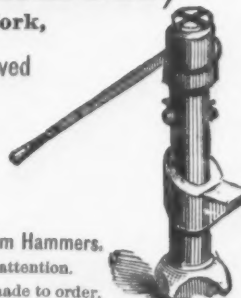
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The Zinc Industry of the United States.

Some time since Herr Wilhelm Strecker, chemist, at Nagy-Bocskó, Hungary, made a tour through this country with a view to examine its mineral resources, and to inquire more particularly into the financial and metallurgical details of the manufacture of zinc and spelter, both of the East and the West. His observations, besides the value they possess as emanating from an impartial and conscientious expert, deserve careful attention because they have revealed many details of working which have never before, we think, been presented so fully. Herr Strecker's account of what he has seen and heard is purely descriptive, and he ventures only rarely to assume the rôle of the critic. The amount of information which he has been able to gather is surprising, and reflects credit both upon his industry and upon the hospitable spirit with which he was received by many of those in charge of the works visited. His essay, which was printed in the *Berg- u. Hüttenmänn Jahrbuch*, 1879, necessarily contains much that need not be repeated by us; we shall, therefore, briefly indicate what to us appear to be interesting facts, figures and analyses. Herr Strecker, after a short historical summary of the development of the zinc industry of the United States, gives the following table of the works now built, the number of furnaces they possess, their capacity and estimated output for 1875:

Name.	Locality.	Furnaces.	Retorts.	Daily capacity, Lbs.	Production 1875.
New Jersey Zinc Co.	Newark, N. J.	1	1	100	100
Pennsylvania Zinc Co.	Berks Co., Pa.	1	1	100	100
La Salle Zinc Co.	La Salle, Ill.	1	1	100	100
St. Louis Zinc Co.	St. Louis, Mo.	1	1	100	100
Carondelet Zinc Co.	Carondelet, Mo.	1	1	100	100
Illinois Zinc Co.	Illinois, Ill.	1	1	100	100
Mathiessen & Hegeler	La Salle, Ill.	1	1	100	100
Chicago Zinc Co.	Chicago, Ill.	1	1	100	100
Total.		7	7	700	700

Since then a second works has been built by the firm of Langen & Co., New Pittsburgh, Kansas, while the establishment of the La Salle Zinc Co. has been purchased by the Mathiessen & Hegeler Mfg. Co., so that there are now in existence 13 works operated by 11 companies. Their capacity has been largely increased since 1875, as a comparison between the figures of the daily output of the furnaces, if working full, with the production of 1875, will clearly show.

The importations of foreign zinc are overbalanced by the export of a special grade of American zinc to Europe, where the metal produced by the Bergen Port Zinc Co. is much sought on account of its high value for the manufacture of cartridge cases.

The ores used by American works have been so frequently and elaborately described that it will suffice to give the analyses made, at Herr Strecker's request, by gentlemen in the laboratory of the Vienna Polytechnic Institute. The figures he gives are as follows:

STIRLING HILL ORE.	
Silica.....	9.75
Alumina.....	1.79
Carbonic acid.....	1.32
Oxide of iron.....	33.69
Oxide of zinc.....	40.86
Protox. of mang.....	12.01
Total.....	99.42

RED OXIDE.	
Oxide of iron.....	0.41
Protox. of mang.....	3.95
Total.....	100.40

FRANKLINITE.	
Oxide of iron.....	58.67
Oxide of zinc.....	17.16
Total.....	99.71

WILLEMITE.	
Silica.....	27.09
Oxide of zinc.....	72.48
Total.....	99.57

Most of the works using the ores of Stirling Hill and Mine Hill, N. J., seek to sort the ore in such a way that the bulk of the franklinite is eliminated, on account of its injurious action upon the walls of the retorts. The Passaic Zinc Works alone, Herr Strecker tells us, claim to work franklinite also with the aid of a flux the nature of which is kept a secret by them.

The following are analyses of Friedensville, Pa., ores used formerly by the Lehigh Zinc Co.:

FRIEDENSVILLE ORE.	
	Coarse. Fine.
Zinc.....	62.51 30.10
Iron.....	2.17 23.63
Sulphur.....	33.21 32.44
Alumina.....	2.01 2.01
Lead.....	no trace
Carbonate of lime.....	0.81
Carbonate of magnesia.....	1.82
Carbonate of gangue.....	11.68

Herr Strecker then gives the two following remarkable analyses of Bergen Port ore, to which we referred in *The Iron Age* of November 13:

		I.	II.
Sulphur.....	28.75	28.75	
Zinc.....	56.28	56.27	
Alumina and oxide of iron.....	1.25	1.30	
Lime.....	3.27	5.50	
Magnesia.....	3.55	3.52	
Carbonic acid.....	8.91	8.91	
Bituminous matter and sand.....	0.52	0.55	
Total.....	104.53	104.92	

We shall, most probably, have occasion to give to the readers of *The Iron Age* the results of further researches on this subject, which we hope will engage the attention of American chemists.

The following is an analysis made of calcined ore from Potosi and Da Soto, Mo., used by the St. Louis works:

MISSOURI ZINC ORE.	
Silica.....	10.24
Alumina.....	75.30
Oxide of iron.....	2.01
Peroxide Mang.....	1.64
Lime.....	4.38
Total.....	100.19

Traces of copper and arsenic.

Herr Strecker then enters upon a detailed and tolerably accurate account of the coal deposits of the United States, showing by a number of analyses the chief characteristics of the fuel used by the Eastern and Western works, the former employing almost exclusively anthracite, while the latter depend upon local deposits for their supply. He gives the following analysis of the clays used, the first, the Woodbridge, being employed by the Eastern works; the second, the Cheltenham clay, being taken by those of the West:

WOODBRIDGE CLAY.		I.	II.
Loss by ignition.....	16.36	16.36	16.37
Alumina.....	37.32	37.32	37.01
Silica.....	42.85	42.85	42.85
Oxide of iron.....	1.18	1.18	1.04
Lime.....	1.48	1.48	1.41
Magnesia.....	0.41	0.41	0.46
Potassa.....	0.76	0.76	0.85
Totals.....	100.36	100.36	99.87

CHELTENHAM CLAY.		I.	II.
Loss by ignition.....	14.55	14.55	14.67
Alumina.....	30.08	30.08	30.27
Silica.....	50.10	50.10	50.10
Oxide of iron.....	2.79	2.79	2.48
Lime.....	1.31	1.31	1.51
Magnesia.....	2.47	2.47	0.29
Potassa.....	0.65	0.65	0.97
Totals.....	100.14	100.14	100.50

The manufacture of the retorts offers nothing of particular interest. It need only be mentioned that one workman alone will average 10 per day, while he makes 13 when he has a helper. The adapters are made very much more rapidly, 200 being the average work of one man per day. The size of the retorts varies at the different works, the length being from 45 to 52 inches, the inside diameter varying from 6.5 to 7.75 inches, while the thickness is uniformly 1.5 inches. At the works of the Mathiessen & Hegeler Manufacturing Company, rectangular retorts are used for the uppermost row, where they resist the impinging flames of the burning gases at their entrance into the furnace, which is fired with gas. They are 60 inches long, 21 inches high and 9 inches wide outside.

The duration, cost and method of calcining the ores naturally vary very considerably according to their character, so that the results differ much at the different works. The Lehigh Zinc Company use eight reverberatory furnaces, through each of which they can put 2800 lbs. of blende in 24 hours, with a consumption of anthracite of 1500 lbs. The calcined ore holds from 1 to 2 per cent. of sulphur, and 3 to 4 per cent. of zinc are lost by volatilization during the process. An analysis of calcined blende yielded:

Silica.....	16.35	Lime.....	5.44
Sulphuric acid.....	6.82	Magnesia.....	3.19
Sulphur.....	0.45		
Oxide of iron.....	28.38	Total.....	99.66
Oxide of zinc.....	39.8		

The Martindale Zinc Co. have smaller furnaces, in which 1950 lbs. of ore are put through in 24 hours. A large double furnace recently built takes 48 hours to complete a charge, working 4200 lbs. in 24 hours with 1820 lbs. of coal. The Bergen Port Zinc Co. is the only one which utilizes the sulphurous acid generated in calcining for the manufacture of sulphuric acid in lead chambers. The Friedensville (Lehigh) blende used by them is first calcined in kilns, the percentage of sulphur being brought down to 5 per cent., which is reduced to 2 per cent. by calcining in reverberators. The amount of sulphur rises to 6 per cent. if lime is present. The calcined ore runs from 48 to 50 per cent. of zinc, the loss of weight by calcination being one-sixth, while the loss of zinc by volatilization is 1 per cent. The Mathiessen & Hegeler Mfg. Co. use two peculiar systems of furnaces belonging to the Gerstenhofer and Hasenlever class. One furnace works 4000 in 24 hours, while three of a different pattern appear to be capable of doing somewhat more.

All the distilling furnaces used in the United States are built according to the Belgian system, although their size varies considerably. The most of those used at Bethlehem contain 56 retorts, while a double furnace at La Salle has 208 retorts on each side. The largest furnaces fired with coal are those at the works of the Missouri Zinc Company, where 160 retorts are put into each. The four Eastern works fire with anthracite on a Wetherill grate. The St. Louis and La Salle works use Illinois coal, and the only furnace using the Siemens-Martin regenerative principle is a double gas furnace holding 240 retorts. We may mention in this connection that the Ponsard regenerator has been tried for distilling rich zinc scum in an American desilverizing works with indifferent success. The Mathiessen & Hegeler Mfg. Co. use gas furnaces without regeneration, three double furnaces with 136 retorts each, one large one with 408 and one single one with 136 retorts, which are arranged in five rows in every case. The uppermost of these rows is made up of six square retorts, capable of receiving a charge two to three times as large as that of the cylindrical retorts. Blende, requiring for its reduction the highest temperature, is charged into the upper row; the second and third receive calcamine, and the lowest dross, &c. The large double furnace turns out 11,000 to 13,000 lbs. of zinc per day, and the yield of the others is in proportion. The furnaces of the Martindale and Carondelet companies are so constructed that the air for the burning of the fuel is heated in flues in the walls before entering the ash pit.

All the Eastern works use anthracite for the reduction of the ore, while most of the Western works mix bituminous coal with the ore, although it is not by any means a suitable material. One Western establishment claims to use, with satisfactory success, an addition of coke, which has, however, on the other hand, been abandoned at the La Salle works. The quantity of coal mixed with the ore before charging varies between 40 and 70 per cent. Five men are required to run an ordinary furnace, their pay being, in some works, regu-

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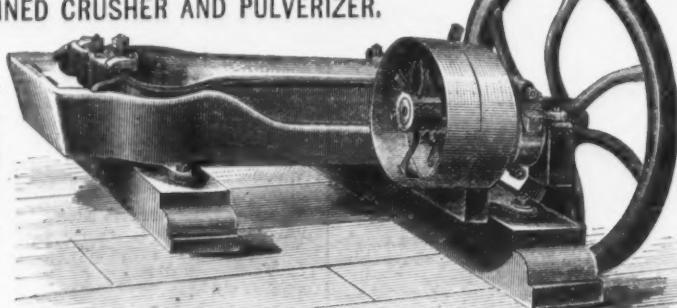
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SEDGEWICK MANUFACTURING CO.,

Poughkeepsie, N. Y.

COBB & DREW,

Plymouth, Mass.

Manufacturers of Copper, Brass, and Iron Rivets: Com-
mon and Special Iron, Leathered, Carpet, Lace and Glass
Tacks; Finishing, Hungarian, Trunk, Glout and Cane
Box Nails, &c. Rivets made to Order.

NEW YORK AGENCY

George C. Grundy,

HARDWARE,

165 Greenwich Street,

Agents for the Philadelphia Star Carriage and Tire Belts.

JAMES COMLY,

Manufacturers of

Hardware Novelties,
Glass Cutters, &c.

CHAS. E. LITTLE, 59 Fulton St., N. Y.

Solid Cast Steel Augers & Reamers

For Boring PUMP LOGS. All sizes in stock
Socket Shank, Ring Handles, and Connecting
Rods for the above order. Also Tensioning Tools
for joining log ends. Coopers' and Slaters' Tools
Tool Chests. Tools for all trades a specialty.

WM. ROGERS & SON, AA,

MANUFACTURERS OF

Cutlery and Silver Plated Table Ware.

KNIVES, FORKS, SPOONS, LADLES, CASTERS, BUTTER DISHES.



WM. ROGERS,
Senior Member and Manager of ROGERS BROTHERS.
On Knives.



F. WILLSON ROGERS,
Son of the late Wm. Rogers.
On Hollow Ware.



Our Knives are guaranteed to STRIP
12 dwts. of Silver per Dozen.
All goods are put up ONE DOZEN IN A BOX.
All our Knives are put up in the latest
and most attractive style, with guarantee
card in every box.

WM. ROGERS & SON, A. A.
Our Spoons, Forks, etc., are guaranteed to STRIP
On Tea Spoons, 45 dwts. per gross.
On Dessert Spoons and Forks, . . . 72 dwts. per gross.
On Table Spoons and Medium Forks, 96 dwts. per gross.

ALL OTHER GOODS IN PROPORTION.
All our SPOONS, FORKS, etc., are plated upon
18 PER CENT. NICKEL SILVER,
The best base known for plating upon.



Sextuple Plate.
Our Hollow Ware is plated upon the
FINEST WHITE METAL, and is guaranteed
to be plated fully
50 Per Cent. More Silver
than any other brand of goods in the market.

OUR GOODS ARE PLATED 20 PER CENT. ABOVE STANDARD PLATE.

The above is a facsimile of our guarantee card which accompanies all goods.

THE HARTFORD.

Pat'd Sept. 23, 1879.



OUR GOODS ARE PLATED 20 PER CENT. ABOVE STANDARD PLATE.

Address all communications to

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HALL, ELTON & CO.,

Electro Plated Ware, German Silver and Britannia Spoons.



THE "EASTLAKE." (Patented.)

Factories, Wallingford, Conn.

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FORKS, SPOONS, Etc.,

Manufactured from Cast Steel, Plated with Nickel and Silver.

WALLACE BROTHERS, Wallingford, Conn.

WILEY & RUSSELL MANUFACTURING COMPANY,

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Lightning Screw-Cutting Machinery and Tools.

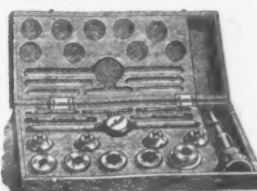
Bolt Cutters, hand or power.
Screw Plates, Taps, Dies and Reamers.
Green River Drills, hand or power, with Screw-
cutting attachment.
Tire Benders, Upsetters, Measuring Wheels,
Horse Shoers' Vises, &c., &c., &c.



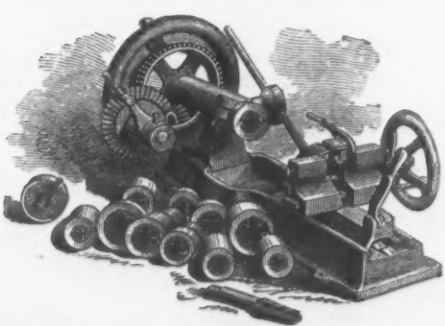
Taps and Dies for the Bit Brace.



Bit Brace Reamers for Wood or Iron.



Special Screw Plates for Model Makers, Carriage Makers and others.



Send for Illustrated Catalogue and Price List.

lated by the output. At the Bergen Port and Passaic works they receive a certain specified sum per day, and in addition are given a certain rate for each pound of metal produced. Herr Strecker states that the average cost of labor is 90 cents per 100 lbs. of zinc.

The number of retorts used of course varies considerably. The following are the percentages of the different works:

RETORTS USED IN DISTILLATION.

	Per cent.
Bethlehem	3.2
Bergen Port	7.1
Passaic	6.4
Martindale	5.2
Carondelet	5.0
Mathiessen & Hegeler	2.5

It has been noted in Western works that the consumption of retorts is very favorably affected by the use of gas for firing. The time during which a furnace can be kept running before requiring repairs so extensive as to cause its blowing out, is given at 15 months for the Bethlehem Works, 1 year for Bergen Port and Carondelet, and 2 years for Passaic.

The following example will illustrate the consumption of fuel, production and yield at 7 of the most important works: At the Passaic Works, Jersey City, N. J., the charge for 70 retort furnaces is 3000 lbs. of a mixture of willemite and calamine, the consumption of fuel is 5000 lbs. and the amount of zinc obtained is 1100 lbs. The three lower rows of retorts are charged twice. The ore contains about 30 per cent. of zinc before calcination, and the yield is 50 per cent. The charge for a 70-retort furnace is 3175 lbs. of calcined blende and 1900 lbs. of anthracite for reduction at the Bergen Port Zinc Works, the yield being 1000 lbs. of zinc, while the consumption of fuel is 5500 lbs. These unfavorable results are due to the high percentage of oxide of iron in the ore, about 20 per cent., which calls for a high temperature and causes a rapid destruction of the retorts. The loss of zinc by volatilization during the distillation reaches 24 to 26 per cent., the total loss being brought by other causes to nearly 33 per cent. of the metal in the ore. A 50-retort furnace at Bethlehem takes 2200 lbs. of ore, the six lower rows of retorts being charged twice. The yield is 882 lbs of zinc, and the consumption of fuel amounts to 4000 lbs. The supply of oxidized ores is drawn from New Jersey, while the blende is purchased in the West, the Friedensville mine, belonging to the Lehigh Zinc Co., having been abandoned some years since on account of the overpowering flow of water. The charge of a mixture of calamine and smithsonite is 4400 to 4600 lbs. for an 88-retort furnace at the Carondelet Zinc Works, the yield obtained being 1786 to 1800 lbs. of zinc at an expenditure of 8000 lbs. of coal. About 38 per cent. of zinc are obtained from an ore mining 47 to 50 per cent. when calcined. At the works of the Missouri Zinc Works each furnace, with 160 retorts, is charged with an ore obtained by calcining 10,000 lbs. of calamine, the weight of coal added for ordinary purposes being 3500 lbs. The amount of zinc obtained averages 4000 lbs., although it varies to the extent of 880 lbs., according to the richness of the ores; 17,500 lbs. of fuel are used. The yield varies from 35 to 40 per cent. of the weight of the raw ore.

From these figures it will be seen that the amount of coal used for 1 lb. of zinc is the following at the different works:

	Fuel.	Reduction.	Total.
Passaic	4.5	1.3	5.8
Bergen Port	5.5	1.9	7.4
Lehigh	4.5	1.7	6.2
Carondelet	4.4	1.8	5.6
Missouri	4.4	1.8	5.6

The yield of zinc is:

	Per cent.
Lehigh, for calamine	73.5
Lehigh, for blende	75.0
Passaic, for calamine and willemite	80.0
Martindale, for blende and silicates	73.0
Carondelet, for silicates	75.80
Missouri, for silicates	70.71

The zinc made by the different works is either placed upon the market in the shape of slabs or as sheet zinc. The former is chiefly used for the manufacture of brass and by lead desilverizers. The metal produced by the Bergen Port Zinc Company is highly valued for the manufacture of brass in connection with Lake Superior copper. There are zinc rolling mills at the works of Messrs. Mathiessen & Hegeler, the Lehigh Zinc Company and the Passaic Zinc Company.

Herr Strecker then enters upon a long and detailed description of the manufacture of oxide of zinc, which we need not enter upon. In conclusion, we would state that Herr Strecker does not appear to have been very favorably impressed by the management of a considerable number of the establishments of this country. In many works he says that analyses of ore are only made occasionally, while a chemical examination of the coals or a determination of their calorific value is never thought of. The quantity of fuel used is frequently ascertained by measure, in a very uncertain and unsatisfactory manner. It is natural that errors in the working cannot be traced when such a lack of system prevails. He excepts some works, and takes occasion to state that one of the best-managed works in this respect is that of the Bergen Port Zinc Company. We are informed that for some years the Passaic Zinc Company have also been carefully conducting a chemical control of their operations. There can be no doubt that Herr Strecker's criticism is a just and wholesome one, and it is to be hoped that the majority of the Western works will, to their own advantage, follow the lead taken in this respect by those of the East.

An Iron Enterprise in Utah.—The Norway Iron and Manufacturing Company, of Utah, having its principal office at Salt Lake City, has been incorporated "for the purpose of mining, smelting, milling and manufacturing metals of iron, gold and silver, and manufacturing pig iron, mineral paints and other articles of merchantable iron." The officers are John T. Lynch, president; Charles Popper, vice-president; Frederick G. Lynberg, treasurer; B. A. M. Froiseth, secretary. These gentlemen, together with J. R. McBride, John Beers and Syvert Iverson, constitute the board of directors. The whole of the stock, \$1,000,000, is paid up.

INDUSTRIAL ITEMS.

CONNECTICUT.

A new three-story brick addition is being made to the Plume & Atwood Manufacturing Co.'s works at Waterbury. The building is 65 feet long and 35 feet wide, and is to be occupied as a machine room and for general manufacturing purposes.

RHODE ISLAND.

The Rhode Island Locomotive Works, of Providence, are to build 25 locomotives for the Manhattan Elevated Railroad at New York.

It is stated that the new torpedo boat built at Bristol by the Herreshoff Manufacturing Company, is for the Peruvian navy.

MASSACHUSETTS.

The Belcher & Taylor Agricultural Tool Company, of Chicopee Falls, have secured the right to manufacture the Garver spring tooth harrow.

Buchanan, Bolt & Co., wire cloth manufacturers, of Holyoke, have doubled the number of their employees.

Work has been commenced in the new foundry at Pocasset.

An enormous metallic reservoir or stand-pipe has been lately furnished to the New York Water Works by the Cunningham Iron Works of Boston. This structure is 150 feet in height and 6 feet in diameter. The first 50 feet from the foundation is constructed of 1/2-inch metal, the next 50 feet is of 3/4-inch metal, and the remaining portion 5-16-inch metal. This is double riveted on the round-about seams, these seams being strengthened on the inside by strips of 1/2-inch metal, 6 inches in width, and the edges of the plates are nicely planed, so that they will match, not lap, as is usually the case when they are thus riveted on to the inside strip. The stand pipe rests upon a cast-iron foundation, weighing 18 tons, which in turn rests upon a stone foundation, measuring 15 feet square. Around the pipe is built a circular wall of brick, 24 inches in thickness, the distance between the wall and standpipe being also 24 inches. This brick wall contains windows at intervals of about 10 feet, which give light to a spiral staircase which winds around the pipe to the top of the structure. There are 32 courses of plates in this pipe and the weight is 60 tons. The Cunningham Iron Works are also engaged in building for the same parties, four 72-inch horizontal tubular boilers, each 16 feet in length, containing 75 4-inch tubes. These boilers are constructed of C. H. No. 1 flange iron, 7-16 shell and 9-16 heads. Each boiler is estimated at 100 horse-power. They have also under way a large tank, 43 feet in height and 8 feet in diameter, with cast-iron head weighing 6 tons. The tank is constructed of 1/2-inch metal and weighs 20 tons. This tank will be placed in a building 200 by 50 feet, which will contain the boilers, also the Duplex Pumping Engines, made at the H. R. Worthington Hydraulic Works. The various works described above are all between 97th and 98th streets, New York City, above the Park, the foundations being about 90 feet above the level of the sea.

NEW YORK.

J. Lloyd Haigh, manufacturer of wire rope, No. 81 John street, has made an assignment for the benefit of his creditors. His liabilities have not yet been definitely ascertained, but are estimated at about \$250,000. The failure has caused much surprise in the trade, as Mr. Haigh owned considerable property, and was believed to be making money on account of his connection with the Brooklyn Bridge. The wire for the latter was manufactured for him in Pittsburgh, and all of the work which did not meet the requirements of the contract was set aside by Mr. Haigh and utilized in other branches of his business. On this outside account he owed the Pittsburgh house at one time \$200,000, for which he gave notes, liquidating them as they became due. His own factory is in Brooklyn, and with the plant he considers it worth \$150,000. He also owns real estate in Westchester County, said to be worth \$200,000, and mortgaged for about half that amount. In July last he was estimated worth \$150,000 over and above his liabilities, and was in excellent credit. Mr. William R. Foster is the assignee. Mr. Haigh is unable as yet to tell the exact amount of his liabilities, and does not know whether they are over or under \$250,000. The Brooklyn Bridge Company, he says, owes him nothing, and he has made the assignment in order to secure payment in full to all his creditors.

Work will probably not be suspended at any of the Troy stove foundries during the holidays this year. The stove dealers are doing an active business, and will be unable to fill orders or prepare for the trade of 1880 if there is any cessation in manufacturing.

NEW JERSEY.

Messrs. Cooper, Hewitt & Co. have a strong force of men employed at the Pequest Furnace, Oxford, New Jersey, getting it ready to blow in. They are making some important improvements, and will probably be making iron early in January.

Ten of the fifteen blast furnaces in New Jersey are now in blast, and three others, viz., the Pequest, Port Oram and Boonton, will soon light up. All of the iron mines in the State are being worked, and the stocks of iron ore are being reduced quite fast. Good iron ores have advanced in price during the past six months from \$3.25 to \$5.50 per ton, f.o.b. on cars, some extra good parcels selling as high as \$6 per ton.

PENNSYLVANIA.

Wister's Furnace at Harrisburg is making 30 to 32 tons of iron per day. The stack is 14 x 45.

Henry Clay Furnace, above Columbia, is to be remodeled.

Rich Bros., Reading, under date of December 23, write: "We regret to say that our works were partially destroyed by fire this morning. We expect to be in running order within two weeks from date, and ask your indulgence for delay in shipping unfilled orders."

The Erie Forge Works, lately destroyed by fire, will be speedily rebuilt. Operations will probably be resumed within two months.

Additions to several of the Erie manufacturing plants indicate an increasing trade. A large structure is about to be erected in connection with the Erie Forge Works.

H. D. SMITH & CO.,

Plantsville, Conn.,

Manufacturers of the

BEST QUALITY CARRIAGE MAKERS' HARDWARE.

Manufacture the Largest Variety of Forged Carriage Irons of Best Material and Workmanship.

PRICES LOW FOR QUALITY OF WORK FURNISHED.

SEND FOR PRICE LIST.

SARANAC HORSE NAIL CO.

Polished or Blued Horse Nails, Hammered and Finished.

The Saranac Nails are hammered hot and the finishing and pointing are done cold. Quality is fully guaranteed. For sale by all leading iron and hardware houses.

S. P. BOWEN, President and Treasurer.

J. W. LYNDE, Secretary.

PLATTSBURG, N. Y.

STERLING & CO., Agents, 7 and 9 Cliff Street, New York.

METALLIC AMMUNITION,

Rim and Central Fire, all Sizes.

GUN WADS, Black and Pink Edge,

Guaranteed Superior to any Imported.

THE UNION METALLIC CARTRIDGE COMPANY,

BRIDGEPORT, CONN.



PRICE LISTS WITH DISCOUNTS TO THE JOBBING TRADE ON APPLICATION.



PERCUSSION CAPS.

F. C. Trimmed Edge, W. Proof.

F. L. Ground Edge, W. Proof, Foil Lined, equal to any imported.

D. W. P. Ground Edge, W. Proof, Central Fire, equal to any imported.

Musket, Paper and Tin Boxes.

Berdan, Orcutt and Wesson Primers.

Bullet Breech Caps.

PAPER and BRASS SHOT SHELLS.

PAPER.

Celebrated "U. M. C." Sizes, 8, 10, 12, 14, 16, 20, Central Fire.

BRASS.

Berdan, Solid Anvil. Sturtevant, Movable Anvil. Buffington, Movable Anvil. Berdan Primer.

Kenney's Patent Indentation to prevent Wads from starting.

Agents: **SCHUYLER, HARTLEY & GRAHAM, New York.**



C. W. DUNLAP & CO.,

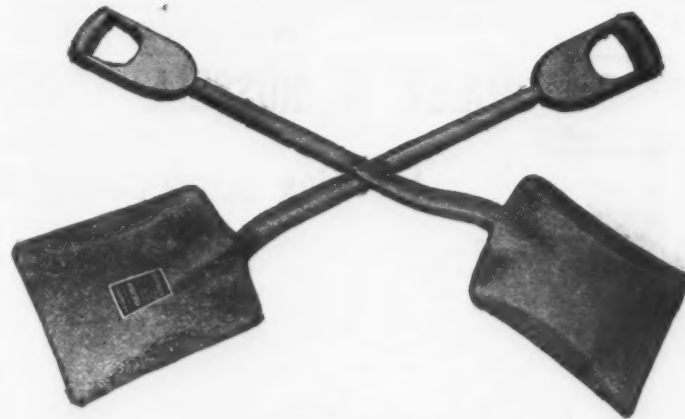
43 Chambers St., New York,

Manufacturers of all kinds superior

HOUSEKEEPING HARDWARE.

Illustrated Catalogues furnished on application.

HUSSEY, BINNS & CO.,



PITTSBURGH.

SHOVELS,
SPADES and
SCOOPS.

ROME IRON WORKS,
Manufacturers of
**Brass, Gilding Metal, Cop-
per and German Silver**
(In Sheets, Rods, Tubing or Wire),
**COPPER & BRASS RIVETS
AND BURS.**
Rome, New York.

**PATENT NICKEL-SEATED
"POP" SAFETY VALVES**



Our Patents cover all
Safety Valves utilizing
the recoil action of
steam, and familiarly
known as "Pop Safety
Valves."
Purchasers, be-
ware of infringements
of our Patents.

Capital, \$100,000.
The Consolidated Safety Valve Co.,
Office and Manufactory,
51 & 53 SUDBURY ST., BOSTON, Mass.

**ALWAYS ASK FOR
ESTERBROOK'S**

Steel Pens.
THE MOST POPULAR PENS IN USE.
For Sale by all Stationers.
ESTERBROOK STEEL PEN CO.,
Works, Camden, N. J. New York.

E. S. LEE & CO.,
No. 4 West Ave.,
Rochester, N. Y., U. S. A.,
Sole Manufacturers
of the
**Celebrated Waters
Tree Pruner.**
Made of best steel in
any desired lengths.
Combines slotted hook
and compound lever
principles not seen in
any other. Having no
competition for public
favor it has received the
highest awards in this
and foreign countries as
being the best.
Send for our new cir-
cular and price list.

Day, Farrington & Co.,
Manufacturers of and Dealers in
**LOCKSMITHS' AND BELLHANGERS'
SUPPLIES.**
Locks, Knobs, Night Latches, Gongs, Blank Keys,
**Wrought Store Door and
Flush Bolts.**
Electro and Hand Silver Platers, Hand-Plated
Name, Number and Pew Plates.
Office, 295 Third Avenue, NEW YORK.
Factory, Brooklyn, E. D.



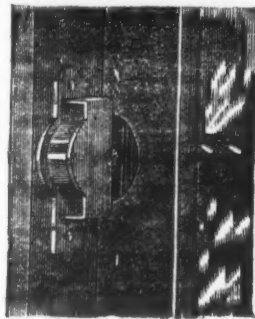
N. Y. MALLET and HANDLE WORKS

Manufacturers of
Calkers', Carpenters', Stone Cutters'
Tin, Copper and Boiler Makers'
MALLETS,
Hawking Beetles, Hawking and Calking Irons;
also all kinds of Handles, Sledge, Chisel and Ham-
mer Handles. Also
COTTON AND BALE HOOKS.
Patented Feb. 13, 1877; a new combination of Hooks.
456 E. Houston St., New York City.

**PATENT
ANTI-WINDOW
RATTLER,**

FOR

Dwellings, Cars, Steamboats, &c.



The Anti-Window Rattler supplies a long needed want; it is so simple in construction that it can be used on any window, and so complete that it will prevent the slightest shaking, no matter how great the jar or how old the sash. As shown in cut, it consists of a rubber wheel in a nickel-plated or brass frame; is ornamental as well as useful, and does not interfere with raising or lowering the sash.

HEATON & DENCKLA, General Agents, 507 Commerce St., Philadelphia.
GRAHAM & HAINES, Agents, 113 Chambers St., New York.
OTIS D. DANA, Agent, 26 to 32 Pearl St., Boston, Mass.

CAUTION.

Whereas certain manufacturers of Horse Shoe Nails are extensively advertising their nails as **Hot Forged and Hammer Pointed**, in imitation of our advertisements and trade marks, and in order that the public may not be deceived by such advertisements, we have had drawings prepared of the different stages of their productions, showing how such nails are made. Fig. 1 represents their hot-forged blank as it comes from the machine. Fig. 2 is the same blank, having "undergone a peculiar manipulation" by



Fig. 1.

rolling, also indenting the end for pointing. Fig. 3, the clipping or shearing taken from the end of Fig. 2. Fig. 4, the nail after being clipped or sheared, which renders it liable

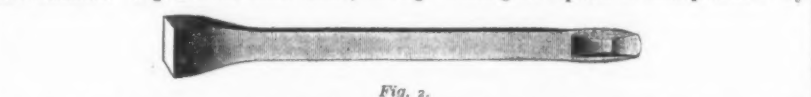


Fig. 2.

to sliver in driving, similar to Fig. 5. An examination of the edges near the point will prove that such nails are not hammer pointed, as advertised, but simply sheared nails.



Fig. 3.

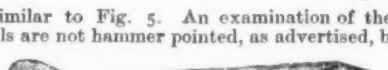


Fig. 4.

Fig. 5. A nail after being clipped or sheared, which renders it liable to sliver in driving, similar to Fig. 5. An examination of the edges near the point will prove that such nails are not hammer pointed, as advertised, but simply sheared nails.

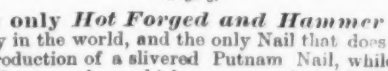


Fig. 5.

The Putnam Nail is the only **Hot Forged and Hammer Pointed** Horse Shoe Nail made by machinery in the world, and the only Nail that does not sliver in driving, and we challenge the production of a slivered Putnam Nail, while we have samples of slivered Nails of the different makes, which we are ready to show in proof of our assertion. Every Putnam Nail is drawn down to a point from the rod, thus:

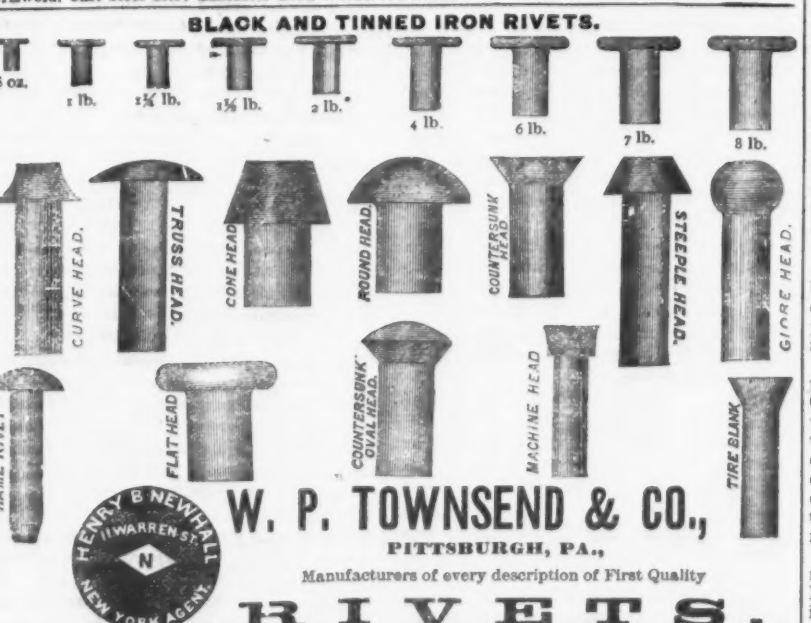
PUTNAM NAIL CO.

COULTER, FLAGLER & CO.,
87 Chambers and 69 Reade Sts., New York,
**Hardware Manufacturers'
Warehouse.**



Gay & Parsons' Double Action Ratchet Screw Driver.

Office and Warehouse of Union Hardware Co.: Rugs Mfg. Co., Draw Knives, Chisels, &c.; Deuse Bros., Bils, Corkscrews, &c.; Richardson Bros., Saws of all kinds; Brooks Edge Tool Co.'s Axes, Hatchets, &c.; M. Price, Hatchets, &c.; J. & W. Rothery, Extra Hand Cut Files; L. D. Frost, Carriage Bolts, Bedstead and Norway Iron; Cowles Hardware Co., Screwdrivers, Mining Knives, &c.; Rider, Wooster & Co., Anti-Friction Barn Door Hangers, &c.; H. B. Hawley, Shears of all kinds; Walden & Co., Pocket Cutlery; American Sewing; N. Y. Anti-Friction Metal Co.'s Rabbitt Metals; Howard, Razor Strops; C. Forchner, Spring Balances; F. Lowen-
traut & Co., Dividers, Callipers, &c.; Shepard Hardware Co., Putters, Blind Hinges, &c.; Saxton & Amedop, Braces, all kinds; Berin Bros. Mfg. Co., Belts, all kinds; B. H. Parsons & Bro., Pliers, Nippers, &c.; C. L. Griswold, Cast Steel Bits; Lancaster Lock Works, Jail Locks.

**W. P. TOWNSEND & CO.,**

PITTSBURGH, PA.,

Manufacturers of every description of First Quality

RIVETS.

H. S. MANNING & CO.,
Sole Sales Agents for THE MORSE TWIST DRILL AND MACHINE CO.'S
Manufacture of Patent Machine Relieved Nut, Hand, Black-
smith and Machine Screw Taps, Screw Plates, Tap Wrenches
and Patent Relieved Pipe Taps and Pipe Reamers, also of Solid Bolt and Pipe Dies. Furnished
in V. U. S. Standard and Whitworth shape
of threads.
111 Liberty Street, NEW YORK.

tion with the Car Works, securing to it needed convenience and facilities.

All the iron mills and furnaces at Dan-
ville are now in full operation.

The Rosena Furnace, New Castle, has
blown in and is working satisfactorily.

During the last few months the Altoona
Iron Co., Altoona, have built four new
double puddling furnaces and an 8-inch guide
train. They are also erecting a 3-ton steam
hammer for reducing puddled bars. All
trains in this mill are running double turn.

The Fairchance furnace at Uniontown has
been purchased by Messrs. DeForest, Lyons
and R. L. Martin, who will put it into opera-
tion as soon as possible.

The Central Foundry and Machine Shop,
Reading, has just turned out a new low-
pressure blowing engine of about 225 horse
power, which has been erected at the Key-
stone Furnace, that city. There are now
three blowing engines at the Keystone fur-
naces, one of which will be repaired. At
the above foundry, some thirty hands are
employed and a large amount of repair
work is being done. Cinder cars are being
built for the furnace at Lyons, castings are
being made for the Hamburg rolling mill.

The lessees of the Reis, Brown & Berger
furnace and rolling mill, New Castle, expect
to start by the 1st of January.

A firm in Reading proposes, if the citizens
of Mansfield, Tioga Co., will take two-thirds
of the stock, to build a nail manufactory at
that place, at a cost of \$25,000, with suffi-
cient capacity to make 200 kegs of nails
every 24 hours.

The Western File Works, Beaver Falls,
are putting an addition to their trip hammer
room in order to increase their facilities.

PITTSBURGH AND VICINITY.

The specifications for the new bridge over
the Monongahela at Glenwood, of the B. &
O. R. R., are completed, and the work will
be commenced next spring when the rail-
road shops will be removed to Glenwood.

W. D. Wood & Co.'s mill at McKeesport,
will shut down for repairs during the holi-
days.

Furnace A of the Edgar Thomson Steel
Company, the old Escanaba probably, has
been charged and will be blown in this week,
and B furnace will be started about the be-
ginning of the new year. We believe C
furnace will be ready for blast about the 1st
of April next. These are all new furnaces,
and are of the following dimensions: A,
65x13 feet; B, 80x20 feet; C, 80x20 feet.
The capacity of the three is estimated at
115,000 tons a year.

The new firm of Williams, Long & Mc-
Dowell are now in the fourth week of their
management of the Keystone Rolling Mill,
on Second avenue, Soho. They employ 300
men and are running double turn in all de-
partments, manufacturing merchant bar
and skelp iron.

It is rumored that the Red Bank Furnace
will soon blow in.

Nails at \$4.25 per keg is somewhat of an
advance over \$2, at which they were sell-
ing some few months since.

The Edgar Thomson Steel Works shut
down on Monday, for the purpose of mak-
ing general repairs, erecting a new cupola,
&c.

The Pittsburgh Bessemer Steel Company
have at length determined upon the location
of their new works. Fifty acres of land
have been purchased by the company about
a mile above the City Poor Farm, near
Homestead, on the Pittsburgh, Virginia and
Charleston Railroad, and the works will be
erected there. Large contracts for ma-
chinery, building material and other neces-
sary details have already been made, and
others are being prepared. It is proposed
to begin the work immediately, in order to
complete the buildings as soon as possible.

VIRGINIA.

The rolling mill near Lynchburg, recently
purchased by the James River Steel Manu-
facturing and Mining Company, will be put
into operation at once, and plans have been
prepared for a large new furnace to be
erected near it, work to begin with the new
year.

It is reported that a number of Ohio
capitalists have been in Lynchburg lately,
looking up a site for a rolling mill, to be
built in case the new proposed railway along
the James River Valley is definitely deter-
mined upon.

WEST VIRGINIA.

The Clifton Iron and Nail Works, Clifton,
were sold on December 4th to J. B. Green
and others. The works are now being put
in repair and will go into operation about
the first of the new year. Mr. Green was
for some years the business manager of the
Gaylord Rolling Mill Company, Portsmouth,
Ohio, and more recently operated the Ferrol
Furnace property in Virginia.

OHIO.

Mt. Vernon Furnace will not blow out
before the middle of March, and is now
chopping 12,000 cords of wood for next
year's blast, mostly on their own lands;
\$1.75 per ton is paid for iron ore delivered.

Jackson Furnace and lands have been
purchased by the Union Iron Company,
Col. Bolles, president. The property will be
valuable to the company only so far as the
timber is concerned, the ore being black
ore, and the furnace building and machin-
ery having gone to irreparable decay. The
company will utilize the timber in the opera-
tion of Munroe Furnace, and will sell or
rent the land for farms.

The new boiler furnaces, ten in number,
recently built at the Laughlin Mill, Martin's
Ferry, have been started, and are now work-
ing satisfactorily.

The Center Furnace is chopping 12,000
cords of wood (six loads on her own land
and ten loads on that of other parties). She
has about 3000 tons of ore on hand, and is
receiving more at \$1.50 and \$1.75 per ton.

The Phoenix Caster Company's works, at
Hamilton, have recently been making some
important improvements at their works, by
which their facilities for turning out casters
are largely increased. The works are now
running with a full complement of hands,
and turning out casters of all sizes. Such
has been the demand for casters during the
past year that the company have found it
necessary to put in a number of labor-saving
machines. One of these is a six-spindle
drilling machine, having six spindles set
apart about 14 inches, operating vertically,
and having the capacity of drilling 5000

pieces per day. Another is a curiously con-
structed machine, having five drilling spin-
dles, working horizontally. It has a daily
capacity of 250 to 300 sets of casters of all
sizes. There is also another for drilling
holes from 11-16ths inch to 3 inches in di-
ameter, with automatic feed. It is capable
of turning out 1000 pieces per hour of the
smaller holes. A reversible, automatic
screw-cutting machine is one of the most
ingeniously constructed, complete and ef-
fective machines in use. It works with
great rapidity, and makes threads of all
sizes, and finishes the heads completely at
one pass; an improved, horizontal, auto-
matic riveting machine, turning out 400
finely finished rivets per hour, and a ma-
chine for turning the faces of anti-friction
wheels; this machine turns a number of
pieces at one time at the rate of 300 per
hour.

The Revolving Scraper Company, of Co-
lumbus, are making a new steel attachment
to their revolving scraper, to take the place
of wood heretofore used. The company
have done a good business in the past year
and have prospects of large orders for the
current season.

A new fire-brick works is being built at
Logan, on the Hocking Valley Railroad.
The facilities of shipment of fire-brick from
this point to Chicago and the Northwest
over the H. V. R. R. will, it is stated, re-
duce the cost of Ohio brick to Chicago about
\$12 a car-load. The brick to be made at
the new works, it is said, will be of superior
quality for furnace linings.

During the present boom in the price of
coal, the Hocking Valley Railroad has not
been able to supply the demand for the coal
from mines along its line, in consequence of
deficiency in rolling stock, and they seriously
contemplate the building of a large additional
number of cars. Heavy shipments of iron,
coal, fire-brick, &c., have passed over this
road to the Northwest and southward in the
past season.

Since the erection of their new and exten-
sive manufacturing establishment at Spring-
field, Mast, Foss & Co. have made and sold
over 1000 of their new iron turbine wind
engines and over 10,000 pumps. They
expect to increase the production of pumps
this year to 15,000. They also manufacture
the Bean double-acting pumps, which are
meeting with ready sales, and they have now
a contract to furnish 500 of these pumps
early this year.

INDIANA.

The Root Hame and Chain Works, of
W. C. Starr & Son, at Richmond, have had
a very successful run during the past year.
They are now endeavoring to procure a full
stock of wood for the coming season's con-
sumption. Their chain department is also
almost entirely cleared of stock, and they
anticipate the necessity of increasing their
manufacturing facilities this year in both
departments.

ILLINOIS.

The nail mill at Centralia is running
steady, single turn. Two new puddling
furnaces are being built, and they will be
ready to light up soon. Prospects are
good for a continuance of work for the
winter.

MISSOURI.

At the Laclede Rolling Mill, St. Louis, the
puddlers returned to work on Monday,
December 22. All the new machinery for this
mill is put up, and is now receiving the fin-
ishing touches. The Siemens and Swindell
gas furnaces are finished, and are being
dried out. The entire mill will be in opera-
tion about January 1, 1880.

The superintendent of the Harrison Wire
Works tells us that they are employing 250
men at present, and are unable to fill orders
fast enough to supply the demand. They
are turning out 40 tons of wire daily, in-
cluding all grades; are using three-fourths
steel and one-fourth charcoal iron. They
are not storing as yet, and orders are 25 per
cent. better than last year.—*St. Louis Com-
mercial Gazette.*

On or before January 15 the Vulcan Iron
Works, St. Louis, will relight its fires and
give employment to nearly 1600 men.

KENTUCKY.

The Estill Furnace has blown out, having
made 660 tons of iron. It will start again
next April and run to its full capacity.

ALABAMA.

Another furnace is to be erected imme-
diately at Birmingham, Ala.

MINING AND MINERAL ITEMS.**COAL.**

The railroad coal operators of Western
Pennsylvania have organized an Exchange
in Pittsburgh, under the title of the "Rail-
road Coal Exchange of Pittsburgh, Penn." The
following officers were elected for the ensu-
ing year, from November 1: Presi-
dent, S. McCrickart; Vice President, M.
Graver; Secretary and Treasurer, J. E.
McCrickart. Directors: S. McCrickart,
chairman; Wm. A. McIntosh, W. D. Clark,
D. Reisinger, Ed. Fisher. Any company or
individual engaged in mining coal on any
railroad that enters the cities of Pittsburgh
or Allegheny, whose mines may be situated
in the counties of Allegheny, Washington,
or Westmoreland, can become a member of
the Exchange by paying a small member-
ship fee.

IRON.

Prospectors are examining iron ore in the
neighborhood of Mooreville, W. Va., for the
Cumbria Iron Company, of Johnstown,
Penn., and the Edgar Thomson Steel Works
of Pittsburgh, who hold the option for large
tracts of land.

Active preparations are being made to
work the iron ore mines near Churchville,
Berks County, Penn. These mines have
been idle for a number of years. A party
of Pottstown gentlemen have effected a
lease, after having had an analysis made of
the ores which has proven entirely satisfac-
tory. The company, by whom the mines
will be hereafter operated, consists of
Messrs. John Selliman, John Weber and
John Andre.

COPPER.

The Northwestern Mining Journal says
that all the active Keweenaw (Michigan)
mines will ship copper overland this winter,
either in the form of mineral or after being
refined at the smelting works.

The Iron Age

AND
Metallurgical Review.

New York, Thursday, January 1, 1880.

DAVID WILLIAMS Publisher and Proprietor.
JAMES C. BAYLES Editor.
JOHN S. KING Business Manager.

RATES OF SUBSCRIPTION INCLUDING POSTAGE.

IN THE UNITED STATES, BRITISH AMERICA AND
SANDWICH ISLANDS.
Weekly Edition \$4.50 a year.
Issued every Thursday morning.
Semi-Monthly Edition \$2.30 a year.
Issued the First and Third Thursday of every month.
Monthly Edition \$1.15 a year.
Issued the First Thursday of every month.

TO ALL OTHER COUNTRIES.

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Weekly Edition \$4.00—£1=25 marks=12
florins=6 roubles (coin)=25 lire=20 pesetas.
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florins=6 roubles (coin)=12½ lire=10 pesetas.
Monthly Edition \$1.35—£1=6½ marks=5
florins=1¼ roubles (coin)=6½ lire=5 pesetas.

Remittances should be made by draft, payable to the order of David Williams, on any banking house in the United States or Europe; or, when a draft cannot be obtained, in postage stamps of any country.

NEWSDEALERS OR BOOKSELLERS in any part of the world may obtain *The Iron Age* through the American News Company, New York, U. S. A.; the Wilmer & Rogers News Company, New York, U. S. A.; and London, England; or the San Francisco News Co., San Francisco, California, U. S. A.

RATES OF ADVERTISING.
One square (12 lines, one inch), one insertion, \$2.50; one month, \$7.50; three months, \$15.00; six months, \$25.00; one year, \$45.00; payable in advance.

DAVID WILLIAMS, Publisher,
83 Rensselaer Street, New York.
PITTSBURGH 77 Fourth Avenue
JOS. D. WELKE, Manager and Associate Editor.
PHILADELPHIA 220 South Fourth Street
THOS. HONOR, Manager.
CINCINNATI Builders' Exchange
T. T. MOORE, Manager.
CHATTANOOGA Eighth and Market Streets
S. B. LEWIS, Manager.
BRITISH AGENCY.

The publishers of *The Iron Age*, 44 Cannon Street, London, England, will receive orders for subscriptions and advertisements on our regular terms.

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The article on "Accidents in Industrial Occupations" in last week's issue, calls to mind the fact that at several recent large meetings the English miners have adopted petitions to the Home Secretary, praying that inquests may be held on every person killed in a mine. This is now done in nearly, if not quite, every case in this country, but this will not cure the trouble. Prof. Stanley Jevons points out the true remedy in his admirable "Lectures to Trades Societies," delivered as long ago as 1868. He says: "It is probable that coal mines will never be properly looked after until the men take it upon themselves to do so; for they alone can have the most intimate knowledge of the condition of the mine, and they alone can efficiently restrain and detect the carelessness which every year leads to such deplorable disasters. * * * Mines will never be thoroughly safe until the men in each form a sort of vigilance committee, alive to every imperfection or carelessness in the management." And if he had added, "or on the part of the employees," it would have been complete.

The Railroad Outlook.

The questions of greatest and most immediate interest for the iron trade at present, are those which relate to the probable expansion of our railroad system during and after 1880. The railroad demand accounts in great measure for the present activity of the iron trades of this country. Should it increase, or even continue without change, we may confidently expect that our furnaces and mills will remain fully employed and prices be sustained, or even advanced. Should it fall off, it would not be long before the market would feel the influence of accumulating stocks and prices show a tendency to weaken. When railroad building is active, nearly all the trades which are classed among the large consumers of iron share the prosperity of this important interest; when railroad building drags, or is suspended, all departments of the iron trade feel the depressing influence in consequence, or because of the same causes which have checked railroad enterprise.

We have spoken of this as a subject of great and immediate interest to the iron trades. We so consider it, although many may believe that, as the immediate future is secure, the questions which are suggested by the present activity in railroad building have a prospective rather than a present interest. Whether this is so or not depends very much upon the conditions under which the present great activity in railroad building has sprung up, and whether it is or is not a short-lived speculative mania: whether it will last one year, ending in collapse and a complete overthrow of confidence in the value of railroad securities, or increase gradually as the requirements of commerce may demand, and fall off as we approach the limits of profitable enterprise in this direction, covering a period of several years of general and healthy prosperity.

A careful estimate made by the *Railroad Gazette* from current records, gives the mileage built during 1879 at 3700 miles. In round numbers we may call the total 4000 miles. Estimates as to the mileage likely to be built in 1880 range from 7000 to 9000. We have the best authority for believing that the mileage to be built next year will exceed that of any previous year, and that not less than 12,000 miles are projected for immediate construction. We may assume, therefore, that there will be no falling off in the iron consumption of the railroads during 1880, and that, on the other hand, our rail and bar mills will be fully and profitably employed throughout the whole year. The ordinary demand for all purposes will be very large, and the extraordinary demand on account of railroad construction and equipment will, without doubt, exceed the productive capacity of the country. What may be expected in the way of supplies from abroad will be considered further on.

An examination of the conditions under which the present activity of railroad building exists, shows that it has not yet assumed the character of a speculative excitement. Most of the capital needed is furnished or borrowed by the companies owning and operating old lines of road. There is no effort making to popularize railroad bonds as investments, and such attempts as have been made have failed. We have a notable instance of this in the utter failure of an attempt to put on the market bonds for the extension of the Chesapeake and Ohio road to the amount of \$1,250,000. The effort was made in good faith, but was completely unsuccessful. The general public are not yet ready for such investments, and may not be for some years to come. The capital needed for the rapid extension now going on is not, therefore, to be had by peddling out the bonds to small investors. It is furnished by the large capitalists already identified with railroad interests. The method is to form a railroad company and a construction company, composed of the same incorporators. The railroad company then contracts with the construction company to build the road, at a price which will permit the latter to acquire the stock without cost and build the road on the income from the mortgage bonds. This, of course, saddles the completed road with obligations upon which it must earn interest to an amount far exceeding its actual cost, but it can scarcely be said to be dishonest, as no intelligent investor buys the bonds of a railroad in ignorance of the fact that the stock issue brings no money into the treasury. But so long as railroad capitalists are furnishing the money which is going into new roads, we may feel confident that, for the present at least, there are few, if any, "wild cat" schemes on foot. Most of the roads now building or about to be undertaken are expected to contribute to the business of existing lines, to earn interest from their own traffic, or to so shorten distances and cheapen the cost of transporting through freights as to benefit interstate commerce to an extent fully equal to their cost. While these conditions exist there is no danger that railroad building will be seriously overdone.

The fact that those identified with railroad interests are in a position to make such enormous additions to the existing mileage, is easily explained. For three successive years we have had to meet an extraordinary foreign demand for products which have greatly increased the earnings of the railroads. Most of the companies owning and operating important lines are in a very strong position financially, with an available surplus and good credit. The roads now building

or in hand are, as we have said, mostly undertaken in the interest of competing lines seeking through connections. When these connections are completed we shall have a sharper competition, resulting from the multiplication of facilities; the pools, now so strongly entrenched, will be broken up, and we shall have a lower range of rates, with lessened earnings for the lines competing for business. By that time there will be no further desire among railroad capitalists to extend or improve their connections. Meanwhile we may expect a crop of mushroom schemes, undertaken by all sorts of people under the idea that there are "millions in it." Gradually we shall see the bond issues advertised, with recourse to all sorts of fair and unfair expedients to float them. If popular confidence, so rudely shaken in 1873, is restored, and railroad mortgages can be made to appear desirable securities for small investors, the present legitimate activity in railroad building will develop into a speculative mania similar to that witnessed in 1868-72, which may be expected to end with a crash, attended with comprehensive and far-reaching disaster. The moment railroad extension becomes a speculation, it will be prudent for those who can to "stand under."

According to Poor's Manual, the railway mileage of the United States was 81,955 miles on the 1st of January, 1879, to which must be added, according to his estimates, no less than 19,500 miles of auxiliary tracks, sidings, &c., swelling the total to 101,455 miles of single track, leaving out of consideration entirely the railway system of the Dominion of Canada. Assuming that the mileage of the present year was 3700, and adding only 20 per cent. to cover the auxiliary tracks of the new roads and extensions of terminal facilities of the old ones, we have a total of 4440 miles of new single track, thus carrying the total to 105,895 miles. As the rails used for one mile of standard gauge track weigh 93½ tons per mile for 56-pound sections, we may safely assume 100 tons as the average amount used per mile. The two important items making up the demand for rails are that for the construction of new lines of travel and that for the maintenance of the old. The latter is, of course, the more uniform and more regular in its increase from year to year. For the future, the inquiry for rails to be used in replacing worn-out track will be continually on the increase, until the large bulk of the tracks in the country have been supplied with steel rails. As yet this has not been accomplished on one-third of the early mileage, as the total amount of domestic and foreign steel laid in this country to the close of this year is about 3,400,000 tons. Taking 300,000 tons as the quantity already removed, we have 3,100,000 tons in use, sufficient to lay 31,000 miles of track. The greater quantity has, of course, been placed on the more important roads, while the minor lines are still provided with iron, which may soon be expected to call for renewal, especially as the past few years have been such as to prevent the weaker corporations from spending much on their permanent way. A large demand for track material for some years to come may still be expected before the effect of the use of a more durable material than iron for rails will make itself felt.

An examination of the past will serve to indicate what the prospects for the future will be, and enable us to arrive, with as close an approximation to accuracy as circumstances will permit, at the minimum demand for rails in 1880. It should be clearly understood, however, that these figures have a value only as indicating in broad lines what aspect the future will wear. We possess a series of valuable figures compiled by Mr. James M. Swank, on the one hand, and by Mr. Henry V. Poor, on the other, which serve as the basis for our deductions. The former gives us accurate data regarding the production of iron and steel rails and the amounts imported, which together are looked upon as representing fairly the consumption of each year. Mr. Poor's statistics of the mileage of each year are as closely correct as possible, but we have in the following table assumed that, in addition to the mileage reported in each year, there was laid auxiliary track, &c., to the extent of 20 per cent. of the whole—a figure which appears low, as the proportion of such track to existing tabulated mileage approaches 24 per cent. But, on the other hand, we have omitted to take into account the fact that, of the 15,000 miles of road laid within the last six years, very nearly 5000 were narrow-gauge roads. Taking, then, the amount of rails used per mile at 100 short tons, and adding 20 per cent. for sidings, &c., we will have the figures given in the following table under the heading, "New Roads." The difference between this and the actual consumption as indicated by Mr. Swank's figures, yields the amounts used for renewals:

CONSUMPTION OF RAILS IN THE UNITED STATES.				
Year.	Mileage.	Total consumption.	New Roads.	Renewals.
1867	2,449	697,137	893,800	331,357
1868	2,979	798,763	337,500	461,263
1869	4,013	906,749	553,800	352,949
1870	6,070	1,019,153	748,700	270,453
1871	7,003	1,341,434	931,000	390,434
1872	5,729	1,530,550	715,000	815,550
1873	4,069	1,148,840	508,600	640,240
1874	3,395	837,794	288,100	549,694
1875	1,758	810,770	219,700	591,070
1876	2,457	879,016	329,100	549,916
1877	2,177	764,744	279,100	485,644
1878	2,747	882,695	343,400	539,295
1879	3,700	1,060,000*	444,000	616,000
1880	7,000	1,490,000*	840,000	650,000

* Estimated.
From these figures it will be seen that from 1867 to 1878 the amounts of rails used for

the construction of new lines have ranged between wide extremes, while the quantities used since 1873 are remarkably uniform. It is probable that a considerable proportion of the excess reported for 1872 was really still in makers' yards and importers' storehouses, and that it ought to be distributed over the succeeding years of adjustment between an excessive supply and a declining demand. The depression following that year is closely reflected in the figures for the years 1873 to 1878, from which it can be shown that the percentage of renewals fell so rapidly that it is impossible to account for it merely on the ground that the increased duration of steel rails brings about a decline of renewals. The financial position of many roads has been such as to prevent their expending more than was absolutely necessary on repairs and renewals, and therefore it appears to us fair to assume that at least 625,000 tons were used for that purpose during 1879, while everything points to an increase in 1880 which will carry the total to an increase of 650,000 tons. During the years 1861 to 1868 the railroad system of the United States expanded slowly. This was followed by a period of revival of at least seven years, from 1867 to 1874, during which time iron rails were very largely laid. Taking 12 years as the average life of an iron rail under average traffic, and it will be seen that from 1879 to 1886 3000 miles will have to be relaid each year, without taking into consideration the older roads requiring a second, third or fourth renewal. The figures we have assumed are not, therefore, by any means excessive, but would appear to be considerably within the mark. With a probable addition to our railway system of 7000 or more miles in 1880, and with current and accumulated repairs to the roads of the country, it is safe to predict a demand upon our iron and steel rail mills for 1,500,000 tons at least. It is a circumstance worthy of mention, in this connection, that during the last few years by far the greater part of the steel rails produced went into old roads, while the bulk of the iron product was used by the new roads, whose limited means prevented their using the more expensive material.

Whether and how far the productive capacity of the steel and iron rail mills of the country can meet this demand, is an important question, since it has a direct bearing upon the course of prices for the coming year. It is comparatively an easy matter to arrive at the production of the Bessemer steel rail mills, because their number is limited, and they have been working very nearly up to full capacity within the past few years. In 1878 their production was 550,000 tons, and by driving during almost the whole of 1879, the output must have been carried to at least 600,000 tons. With the coming year, 1880, the Vulcan Works will fully enter into line and swell the product to 700,000 tons. A more difficult matter is the estimation of the product of the open-hearth furnaces, which in 1878 produced 9000 tons of rails. The great element of uncertainty at present is the capacity of the iron rail mills, because it cannot be definitely ascertained how many have been dismantled, or how many may be called into existence or become productive under the stimulus of the present revival. Their maximum capacity was fully taxed in 1872, when 900,000 tons were turned out, but the output dwindled down to 323,000 tons in 1878. A careful estimate of the year 1879 has yielded a total of 450,000 tons. A fair basis of what the year 1880 may be expected to show, may be obtained by taking the last three months of 1879 as fairly indicating the capacity for the future. Deducting from the total 160,000 tons, as representing the work of the first half of the year on a scale equal to that of the preceding period of twelve months, and assuming the next three months to show an advance of 50 per cent., or 120,000 tons, we have 450,000 tons, less 280,000 tons, or 170,000 tons for three months' full work. Under the stimulus of present prices our manufacturers will probably strain every nerve, and we may expect to see, as the result, a production of at least 700,000 tons for 1880. All the rail mills of the country may, therefore, be counted upon as being capable of turning out a total of 1,400,000 tons.

Taking the probable demand at 1,500,000 tons, and deducting the supply of rails of all kinds which our mills are capable of furnishing, there will remain a deficiency of at least 100,000 tons to draw on from abroad, and notably from England. The shipments of rails from that country during the year 1879 cannot serve in any way as a basis for an estimate of the future. For eleven months ending December 1, 1879, the exports of rails to the United States were 17,316 tons of iron rails and 20,374 tons of steel rails, so that the total for the year, or rather for the last three months, since when shipments have been made, will not exceed 50,000 tons. Unfortunately we do not possess any accurate and recent statistics from which the maximum capacity of English rail mills, their production in recent years, or the home consumption present or prospective, can be based. The only accurate figures carried up to date are the Board of Trade returns of imports and exports. From these it seems that the steel mills have very largely extended their market, although not so rapidly as the contraction of the exports by iron rail mills has been. The latter may, therefore, be looked upon as a reserve upon which urgent purchasers may draw very liberally, unless prices on the other side should advance to a

point that would render importations unprofitable.

From a recent article in the *London Times* it would appear that numerous projects for railway extensions are being successfully launched in England, where the home demand will most probably come very near the productive capacity, at least so far as regards steel rails. It is not, therefore, likely that American railroads will be in a position to obtain any considerable supplies from Great Britain. It is a different matter with Germany, where, we are told, the output of the steel works can be made to go far beyond the requirements of local markets. Belgium and France will be too fully occupied in filling the government contracts, which the projects of M. de Freycinet will throw upon their hands, to spare any considerable quantities for export to this country.

One circumstance will tell very much against foreign producers, and will, to a certain extent, favor Western mills. We allude to the fact that the present and prospective demand for rails for renewals comes almost entirely from our Western States. This is clearly shown by figures recently published by the *Railway Age*, from which it appears that out of a total of 3738½ miles built in 1879, Kansas has 498 miles; Minnesota, 394; Iowa, 371; Dakota, 220; Tennessee, 176; Missouri, 188; Texas, 187; Arizona, 153; Nebraska, New Mexico and Utah, 125 miles each. Ohio built only 213 miles, while New York takes a low rank with 73½ miles; Pennsylvania, 19 miles, and not one of the New England States adds more than 15 miles to the total. One-fourth of the mileage was narrow-gauge road, of which the largest totals are furnished by Ohio, Idaho, Colorado, Illinois, Michigan, Texas and Tennessee.

The Old Year and the New.

Our readers will find in our columns this week the first installment of our usual annual summaries of the iron and metal markets, which give so full and accurate an account of the course of business during the remarkable year just closed, that it is unnecessary to dwell upon their salient features. The history of the eventful two months just closed will be perused with profit, and we trust that to the majority of the readers of *The Iron Age* it will be marked by pleasing recollections of successes, which the coming year, full of promises as it is, will, we hope, multiply. The outlook is, to say the least, encouraging to those engaged in the iron industry and allied or dependent trades, all of which may expect a full share of the general prosperity. Prudence, dearly bought by the long experience of many years of depression, will guide manufacturers, merchants and dealers in their transactions, and it is to be hoped that the lessons taught by adversity will be remembered for years to come.

The Tay Bridge Disaster.

On the afternoon of the 28th of December the Tay Bridge across the Frith of Tay, near Dundee, broke, and a train of the North British Railway, consisting of four third class, one second class, and one first class car, an engine and a brakeman's van, was precipitated into the Tay, which averages 40 to 45 feet in depth at that point. The number of passengers and employees drowned, which includes all those on the train at the time, is variously estimated between 75 and 100. The dispatches received until now are conflicting and unsatisfactory, but it appears certain that at least 12 spans have dropped into the river. Whether they were carried away before the train entered on the bridge by the hurricane prevailing at the time, the fury of which is said to have been exceptional, or whether while under the load, is not yet known. The following details of the bridge will convey an idea of the work and some of the points which shed some light on its construction and history.

The bridge across the Tay, commenced in 1871 and finished in 1877, ranks as one of the most important engineering works carried out in Great Britain, its total length being 10,321 feet. Commencing from the south, or Frith side, there are six spans of 27 feet, fourteen of 67 feet 6 inches, fourteen of 70 feet 6 inches, two of 88 feet, one of 162 feet, one of 170 feet and thirteen of 245 feet. The first three spans on the south side are on a descending gradient of 1 in 100, the two next spans are level; the bridge then rises with a gradient of 1 in 353 to the center of the 245 foot spans. It again descends with a gradient of 1 in 73.56 to the north shore, passing at a height of about 18 feet over Magdalen Point. The bridge thus comprises 85 spans, and at the commencement on the south side the rails are 78 feet above high water, running over the tops of the girders as far as the 245 foot spans, which cross the navigable channel of the river. Over these thirteen spans the rails run on the bottom of the girders, giving a clear headway of 83 feet above high water. On reaching the next spans on the north side, the rails are again on the top of the girders, which is continued to the north shore. From the south side the first five spans are on a curve of 1320 feet radius. The bridge then runs straight across the river, and then makes a curve of 1320 feet radius, forming nearly the quadrant of a circle, the length being about 2000 feet. The bridge has one line of rails and a footpath on each side.

After the death of Mr. Charles de Bergue

the first contractor, the bids of Messrs. Hopkins, Gilkes & Co., of Middlesbrough, were accepted, and they furnished the materials, about 3500 tons of wrought iron and 3700 tons of cast iron. The bridge was designed and its construction superintended by Sir Thomas Bouch. Whether the recent breakdown is due to the defective design or bad materials, or both together, is matter which a careful expert investigation alone can decide. Middlesbrough iron, the material used by the contractors, does not enjoy the reputation of being the strongest and best. It was stated, at the time when the bridge was built, that the girders of each span were calculated to carry a rolling load of 1½ tons per running foot besides their own weight and planking, and that no part of the iron would be strained more than 4 tons per square inch when carrying this load. That the bridge was amply strong to sustain any wind pressure to which it might be subjected, was believed by its engineers to be beyond doubt. It was in answer to other engineers, who flatly asserted that the structure would be blown over, that one of its promoters said, in a published paper in *Engineering*: "The exposed surface of one large pier is about 800 square feet, and of the superstructure, which depends upon it, about 500 feet more, and so, giving 800 feet for a train above, we have 2400 square feet. Twenty-one pounds per square foot is the force of a very strong gale, but it would take no less than 95 lbs. per square foot on the surface given to overturn the pier. Even the most severe hurricane on record would equal only one-half this resistant power."

It is noticeable that, while the structure was in course of erection, an accident occurred which significantly demonstrated the tremendous force of the wind, and the possibility of just such a terrible disaster as that which occurred on Sunday evening. On the afternoon and night of the 1st of February, 1877, a fierce gale was blowing. Near the south side of the bridge two of the large iron girders, weighing each nearly 200 tons, had been raised up to the full height of the structure, but were still hanging in the lifts between the piers. Fifty-four men who were employed at this point ceased work at 5 o'clock, but owing to the severity of the gale it was impossible to communicate with the shore. About 8 o'clock, a few minutes after several of the men had left a shanty placed on top of the girders to another uncompleted portion of the structure, a fierce squall struck the bridge. It carried away the two ponderous girders, and the pier on which they rested snapped, the whole mass falling with a heavy crash into the river amid flashes of fire from the splintered iron-work. Fortunately, only one man was injured, and the whole party were released by a steamer on the storm abating next morning at 5 o'clock. It was stated at the time that "the accident in no way indicated any want of stability in the work."

It is also of especial interest to turn to the results of the official test of the bridge, the latter being conducted soon after the completion of the structure, early in March, 1878, by Major General Hutchison, Inspector of Railways for Scotland. Five locomotive engines, with their tenders, aggregating a weight of 360 tons, were distributed over one of the largest spans of 245 feet in length. This load was first placed on the girder as a dead load and then as a moving quantity—the utmost deflection or bending being only 1¼ inches. It was determined that this weight was fully double that of all the coal wagons and three times that of all the filled passenger carriages which could be got on the span. Speaking of this test *Engineering* says:—"The result is the complete establishment of this fact (so important to the public) that the bridge is strong out of all proportion to its possible necessities. As a matter of fact, the load which the structure is calculated to carry is six times greater than that to which it was subjected by General Hutchison."

The cable reports that the designer and builder of the bridge, Sir Thomas Bouch, has made an inspection and states that in his opinion the train proceeded without interruption until it reached the high girders. Then one or more of the back carriages went off the rails, coming against the lattice work, and tore the structure to pieces, causing the frightful disaster. Whatever a careful examination may lead to, it is certain that the plans for the Frith of Forth bridge, a still greater enterprise than the Tay bridge, to be built by the same engineer, will be fully re-examined in the light of the fearful experience with this earlier work. American engineers will closely watch developments in this important investigation, which cannot but shed a flood of light upon the dangers to which such structures are liable.

The Scheme of So-called Reciprocity with France.

M. Leon Chotteau is actually coming to the United States again. It would be interesting to know just what M. Chotteau and those associated with him hope to accomplish; what object they have in view. M. Chotteau seems to be a man of sense and ability, and he has less of both than we credit him with if he has any hope of securing the adoption of the proposed treaty. The satisfaction with which our French friends cherish the pleasant delusion that the people of this country want reciprocity with France, is really quite amusing. With scarcely an exception, no American of note as a politician or merchant has espoused the

cause of this treaty. Some of our most important Chambers of Commerce and Boards of Trade have listened to M. Chotteau and passed resolutions, but in most cases they can be summed up in a formal "Thank you, sir," and in some cases they have been decidedly hostile. Were our people to decide on a change in our tariff laws, the treaty proposed by M. Chotteau would have no prospect of adoption. Our friends across the water may credit us with being tyros in matters pertaining to trade between nations, but we are not idiots. If ours is a mistaken policy we have deliberately adopted it, and have adopted just what we meant to have and because we thought it to our interests, and until we have lost all sense we will never adopt M. Chotteau's treaty. If we do have reciprocity it will be reciprocity, and not something in which the benefit is all one-sided.

M. Chotteau should at least give us credit for some degree of shrewdness and care for our own interests, but his speeches do not show it. If he really and honestly desires a reciprocity treaty, let him frame one that will give our products the same position in his market that he desires French products to have in ours—a treaty that will put our iron and farm products in Paris as he desires to put silks and wines in New York, and then we shall be able to give him credit for sincere efforts to promote international trade on a basis of mutual advantage to France and the United States. As it is, however, he comes here simply as the agent of a clique of French manufacturers who are desirous of securing advantages in this market they do not now enjoy, and who are not in a position to offer us an equivalent for the injury which would be done to certain promising industries in this country by the withdrawal of the protection now afforded them. M. Chotteau cannot but see this, though it is not to his interest to say so; but we suspect that if he had to pay his own traveling expenses and get nothing for his services, he would not come back to this country on any such errand.

The winter meeting of the American Institute of Mining Engineers will be held in this city, beginning February 17th. The local committee are Messrs. A. S. Hewitt, J. A. Burden, A. L. Holley, R. W. Raymond and C. MacDonald.

ANNUAL REVIEW

OF THE

Manufacturing and Iron Industries of Eastern Pennsylvania.

Pig Iron.

The Iron trade during the past year has been one of extraordinary improvement. During the first six months the appreciation in values was slow, but every advance was maintained. The total decline in 1878 was recovered in the first six months of the present year, while the advance since then has been no less than \$12 @ \$14 per ton. During the month of July prices began to harden a little, showing at the close an advance of about \$1.50, the price of No. 1 Foundry being at that time \$20.50 per ton. During August the market gained further, until \$23 was the quotation, first week in September. From that time the advance was very rapid, and the quotation on October 2nd was \$31, a clear gain of \$10 per ton in five weeks. Prices remained steady during the greater portion of the month, but during November the market was quite unsettled, and some parties, under an apprehension of a serious decline, forced sales of Foundry Iron at a reduction of from \$3 @ \$6 per ton. Forge Iron, however, was more firmly held, and several of the leading companies made no change whatever, although some parties made concessions of from \$2 @ \$3 per ton. Early in December it became evident that the demand for Iron was in excess of the supply, and as consumers found their requirements increasing, heavy purchases became with many a matter of necessity. This naturally gave fresh strength to the market, and prices quickly reacted, until at the close of the year quotations are higher, by at least \$2 per ton, than at any time within the period under review. It is difficult to say anything in regard to the future, but the fact of the workshops in all parts of the country being full to overflowing with work, seems to insure a continued heavy consumption of Iron. The impression is general that prices of Pig Metal will show another heavy advance before the first of May, and, if the revival in Europe is at all in proportion to what it is here, there can be little doubt that the appreciation in values during 1880 will equal, if not outrun, that of the year now closing. Fears are expressed, however, that "the thing will be overdone," and ultimately there is no doubt that it will be overdone; but, in the meantime, parties who have heavy contracts on hand, and others of a profitable character in prospect, are not going to be restrained from purchasing to cover their requirements on the ground that by so doing they assist in forcing up high prices. For the present this appears to be the actual condition of affairs, and although consumers are now buying twice and three times as much for forward delivery as they did during the past two years, it is simply because their requirements are proportionately heavier. This has been their experience during 1879, and will no doubt be repeated during 1880. The same may be said in regard to finished Iron in all its forms. During the past week or two we have made careful inquiries in regard to this matter, and many large consumers have informed us that they find difficulty in obtaining material to meet their actual requirements, which clearly shows a pressure along the whole line, from the machine or car shop through the mills direct to the furnace. We may, in fact, go still further, the furnace men being equally pressed to get ores and

other material. Taking these facts into consideration, it does not seem likely that there can be any reaction at present. The heavy importations of foreign Iron have not as yet affected the market unfavorably, but on the contrary have been of material assistance to many consumers, who, without such a source of supply, would scarcely have been able to keep their mills running. There may eventually be danger of excessive importations if prices run much higher, but for the present the supply from all sources is not beyond the requirements of the market. The importations of foreign ores are very large, and seem likely to reach upward of 500,000 tons for the coming year. The American mining companies feel themselves aggrieved at what they regard as unfair discrimination in duties, the tariff on ores being ad valorem, equal to about 20¢ to 30¢ per ton, while Pig metal and finished Irons are subject to specific duty. They claim that while the tariff has done much to protect the Iron trade, there has been no inducement for developing native resources for ores, so that with the present immense demand for Iron, the business, to a large extent, is dependent upon foreign countries, notwithstanding the magnificent resources at home. This matter is one of much importance, and is already seriously affecting prices of Iron. Ores are about double the price at which they were offered a year ago, and cannot be had in anything like proportion to the demand. It seems as though the ironmasters ought to interest themselves in developing, at their own doors, resources which so far appear to have been greatly neglected. In previous reviews we have compared the price of Old Rails, at the close of each year, with Forge Iron, which may again be of interest:

	Gray Forge.	Old Rails.	Diff.ence.
1874.....	\$20.00	\$41.00	12.00
1875.....	20.00	31.00	3.00
1876.....	19.00	31.00	2.00
1877.....	17.00	30.00	3.00
1878.....	15.00	20.00	5.00
1879, July.....	16.75	24.25	7.50
1879, Dec. 30.....	31.00	36.00	5.00

Mr. Swank, secretary of the American Iron and Steel Association, estimates the production of Pig Iron during 1879 at 2,800,000 gross tons, against 2,300,000 tons in 1878, which is within about 2 per cent. of the heaviest years ever known in the history of the trade. The importations of Pig Metal during the year are estimated at 275,000 tons, giving a total supply for 1879 of upward of 3,000,000 tons. This amount, large as it is, has been easily absorbed, and buyers have far more difficulty in placing orders to-day than they had a year ago, although prices are now \$12 to \$18 per ton higher. The following shows the quotations of No. 1 Foundry Iron at the close of the years: 1872, \$45; 1873, \$32; 1874, \$26; 1875, \$23.25; 1876, \$21; 1877, \$19.50; 1878, \$18; 1879, \$35.

Structural Iron.

The consumption of this class of Iron during the past year is believed to have been greater than at any time in the history of the trade. The elevated railways have been large consumers, having taken during the year something like 80,000 tons. The demand for architectural and bridge purposes has also been very large, while car builders have been constantly in the market, and the consumption in this direction has been steadily increasing, with every indication of its continuance. At the moment there is probably less work actually on hand than there was a year ago, but it is because manufacturers have confidence in obtaining full employment, and prefer taking contracts from time to time in preference to loading up too heavily at present rates. There is enough new business offered to-day to fill up the works for three months to come, so that anticipations of an active business seem to have a substantial foundation. The leading firms are all employing more hands than they did a year ago, averaging probably 25%, the advance in wages in the same time being about 10% @ 20%. The amount of work turned out will average nearly a third more than in 1878, with indications of a still greater increase in the coming year. Prices have advanced about 75%, the quotations to-day being the highest of the whole year, with strong indications of a further advance at an early date.

Plate Iron.

The demand has been active during the whole year, but for a long time prices were ruinously low. Early in June the market began to stiffen, and an advance of from \$1 to \$2 per ton was made from time to time, until in August a gain of \$10 was established as compared with prices at the commencement of the year. The market continued to advance steadily, and by the middle of October there was a further appreciation of \$35 per ton—a total gain of \$45 within 10 months. Since October prices have remained steady, yielding in a few instances during the latter part of November, perhaps \$3 @ \$5 per ton, which, however, has since been recovered. The falling off in the demand from the shipbuilders was felt rather severely in the early part of the year, but for several weeks it seemed impossible to place an order at quotations, unless subject to deliveries at sellers' convenience. In this condition of affairs orders were dispatched to England, and for a while there seemed to be danger of the market being overdone, but there are fresh evidences of a more active business, and supplies now are not in excess of the demand. The rapid advance in prices interfered with two or three important contracts for iron steamships, but they may be closed this spring, unless prevented by another upward movement in Iron. Compared with the close of 1878, prices show an average advance of 75% @ 90%, with prospects of a steady market and possibly higher prices in a short time. The following quotations show the changes within the year:

	Common Plates.	Flange Iron.
Dec. 31, 1878.....	2.25	3.85
Dec. 30, 1879.....	4.10	5.5

Sheet Iron.

The demand throughout the year has been of an extraordinary character and in excess of anything heretofore known. During the first six months there was very little change in values, but in July the market began to

advance, until in October a clear gain of 60 @ 80 ¢ was established. The demand during the past six or eight weeks, as usual at this season, shows a considerable falling off, but stocks were so reduced that the mills kept on running to their fullest capacity until the Christmas holidays, and the suspension, it is expected, will not be longer than is necessary for repairs, &c. Some importations of Sheet Iron have been made, the most important being a direct shipment from Russia to a firm in this city, but there is no apprehension of serious competition from abroad. So far as can be seen at present, there is every reason to expect an unusually heavy demand during the coming year, at a range of prices higher than now quoted. Some of the leading buyers are already in haste to fill their order books too early, as they did last year. For delivery during the next two or three months it is possible that slight concessions would be made, but for the summer months there is no disposition to accept business at present prices. The outlook is entirely satisfactory, and there seems to be little doubt that quotations current at the commencement of the year will be maintained, and probably advanced, in the course of a few weeks. The following comparison of prices may be of interest, as showing the change during the year:

	Common Sheet.	Best Bloom.
December, 1878.....	2.0	5.0
December, 1879.....	5.0	8.0

Bar Iron.

Perhaps no department in the Iron trade has shown greater improvement than that in Bars. During the first half of the year the demand was heavy, but prices were demoralized, and it seemed impossible to do business at a profit. An advance of 1-10¢ was obtained in the six months, but the market had an unsettled appearance, owing to the strenuous efforts of Western manufacturers to force their products on the Eastern markets. For a time a break seemed imminent, and Western manufacturers were so convinced that the advance was premature, that they determined to reduce wages, which action, however, was soon reversed, and an advance given of more per cent. than they had claimed a few weeks previously as reduction. This incident shows how unexpected the movement was, even with leading men in the trade, who might reasonably be supposed to be best able to judge as to the condition of business. It is probable, however, that the strike at that juncture had some influence in precipitating the demand. In any case, the upward movement from that time forward has been steadily maintained, and although there has been a slight falling off in the demand during the past four or five weeks, prices are now more firmly held than at any time in the whole year. Changes in quotations were made as follows:

July 24.....	\$2.16	September 4.....	\$2.36
August 14.....	2.24	September 18.....	2.36
September 4.....	2.36	September 25.....	3.07

and from October onward 3¢ has been an exceptional rate, the general quotation being 3.25¢, and at this writing no heavy orders would be accepted even at that figure. Orders were forwarded to England during the summer months, but we have not heard of anything like serious competition. Such importations as were made were lost sight of in the extraordinary consumption, which has continued almost without intermission. The reports of heavy foreign shipments to Boston and New York seemed likely to curtail the demand from buyers in that direction, but such has not been the case so far, and desirable orders have been declined simply because manufacturers were not able to fill them. The outlook presents most encouraging features, and there seems no reason to doubt that the present activity will be of some permanency. Consumption is extraordinary in all directions. Machine shops and similar interests are running full, averaging at least 50% more business than at this time a year ago. The demand is therefore entirely legitimate, and appears likely to continue until the enforced economy of the past five years has been fully recovered. Notwithstanding the increased production, the mills are full of work, with prospects of still greater demand in the immediate future. Skelp Iron has been in constant demand, and several leading consumers, in order to secure prompt supplies during August, had to place orders in England. Prices have advanced, however, so that at present there is no inducement to repeat the operation. The advance in this class of Iron has been about 90%. Quotations are now 3.75¢, against 1.0¢ a year ago.

Steel Rails.

The Steel Rail trade has been one of continuous activity since the opening of the year, and manufacturers have had only to name terms in order to obtain purchasers. Prices have steadily advanced from \$42 at the opening of the year to \$70 at the close, which is possibly the lowest rate at which business could now be done. In fact, manufacturers are so crowded with orders that they are afraid to name a price, preferring rather to reduce contracts already on hand, and take the risk of the market in the future. The demand during the coming year is likely to be even more urgent than before, and prices will necessarily advance in proportion to the cost of production. Bessemer Pig Metal sold at \$17.50 a year ago, while \$37 has been paid for large lots during the past week, and still higher prices are confidently anticipated. Early in the season there was some apprehension that foreign Rails would interfere with the market, but this has not been the case, orders, as we have before mentioned, being more numerous than ever. In addition to the Vanderbilt contract for foreign Rails, we cannot trace sales of more than 25,000 tons through other sources, and the importations so far have been quite small. The indications of a revival in the Iron trade in England are now of such a character as to remove all apprehensions of dangerous competition from that source. The production during the year is estimated at 650,000 gross tons, an increase of about 150,000 tons as compared with 1878.

Steel Blooms.

The probability of large shipments to this country has excited a good deal of atten-

tion, but the actual quantity brought in so far is less than 1000 tons. Upward of 50,000 tons were bought, and are probably still held in Europe by American parties, but it is extremely doubtful if they will be brought here, prices in Europe offering a heavy margin for profit. First sales in Philadelphia were at \$47, and a small lot sold at \$60 a few days ago.

Iron Rails.

The improvement in the Iron Rail trade has been continuous since the opening of the year. Orders have been plenty, and the only drawback, so far as sellers are concerned, has been in accepting orders too freely. Prices at time of making the contract seemed to be fairly satisfactory, but before the work was well begun, other orders were offered at a considerable advance on previous prices. This feature of the trade has been repeated time and again, and seems likely to extend into the coming year. The advance in material has exceeded all calculations, so that profits have not been at all in proportion to the advance in prices. We mentioned the case of a firm some time ago, who were delivering New Rails and at the same time actually paying a higher price for Old Rails. This, to some extent, has been the experience of others in the trade. The course of the market is best shown by the following quotations, taken from *The Iron Age* on the 1st of January and each succeeding month:

1879.		1879.	
January.....	\$32.50	July.....	\$38.00
February.....	33.50	August.....	39.50
March.....	34.00	September.....	41.00
April.....	34.00	October.....	45.00
May.....	34.00	November.....	51.00
June.....	37.00	December.....	53.00

closing firm this date at \$55. Considerable purchases of foreign Rails are reported, and the arrivals so far are estimated at upward of 20,000 tons. The advance in prices abroad appears to keep pace with the market here, and there is no immediate anxiety in regard to foreign competition. The production during the year is estimated at 450,000 tons, an increase of upward of 150,000 tons on the preceding year. The outlook is excellent, and there is no doubt that the mills during the coming year will be taxed to their utmost to keep pace with the demand.

Old Rails.

The demand for Old Rails has been one of the most remarkable features of the Iron trade, and prices from the opening of the year have shown a steadily advancing tendency. The following quotations on the first of each month during 1879 will probably give a correct idea of the market, and obviate extended comment:

January.....	\$20.00	July.....	\$24.25
February.....	20.00	August.....	25.00
March.....	21.00	September.....	27.00
April.....	22.00	October.....	29.00
May.....	22.00	November.....	31.50
June.....	23.00	December.....	32.00

and \$36 at the close of the month. The total imports are estimated at about 150,000 tons, and the demand to-day is more urgent than ever. The supply of American Rails appears to be nearly exhausted, and still higher prices are anticipated at an early date.

English Trade Marks in the United States.

Mr. Edmund Johnson, honorary secretary of the London Trades Marks Committee, in a letter on the subject of trade-marks in America, says: "The recent decision of the Supreme Court is occasioning much excitement among the Americans themselves. This is in no way surprising, when it is considered that under the provisions of the trade-mark laws, now declared to be unconstitutional, about 8000 native and foreign trade-marks have been registered at the Patent Office in Washington, while about 200 applications for registration are now pending. It will probably be some days still before the full text of the judgment reaches this country, and it would seem to be premature to form any definite conclusions until there has been an opportunity of examining the full scope of the judgment. A New York paper, however, states that the court wished to be understood as leaving the whole question of the treaty-making power of the general government over trade-marks, and the duty of Congress to pass any laws necessary to carry such treaties into effect, untouched. The declaration of the 24th of October, 1877, between Great Britain and the United States, contains what is termed a 'most favored nation clause,' under which subjects or citizens of each of the contracting parties have, in the dominions and possessions of the other, the same rights as were then granted, or might thereafter be granted, to the subjects and citizens of the most favored nation in everything relating to property in trade-marks and labels. There are several treaties between the United States and other countries—perhaps on the most favorable terms with Russia—for the mutual protection of trade-marks, under which the rights of protection, respectively, are made dependent upon the lodging of the trade-mark in the country in which the right of property is desired to be secured. From the foregoing remarks it seems not impossible that it may eventually transpire that the rights of British subjects who have already registered, or who may hereafter lodge trade-marks in the Patent Office at Washington, may be unaffected by the recent decision. * * * Americans entertain the greatest objections to the alteration of the Constitution, and yet an alteration would appear to be necessary if there is to be a uniform trade-mark law for the whole of the States constituting the Union, as there would seem to be but little likelihood of independent unanimity on this subject among the different States."

The interference case, which has for some time been pending in the United States Patent Office, between Jacob Reese, of Pittsburgh, and Sydney G. Thomas, of England, was decided in favor of the former and the Bessemer Steel Company, Limited, on the 22d of December.

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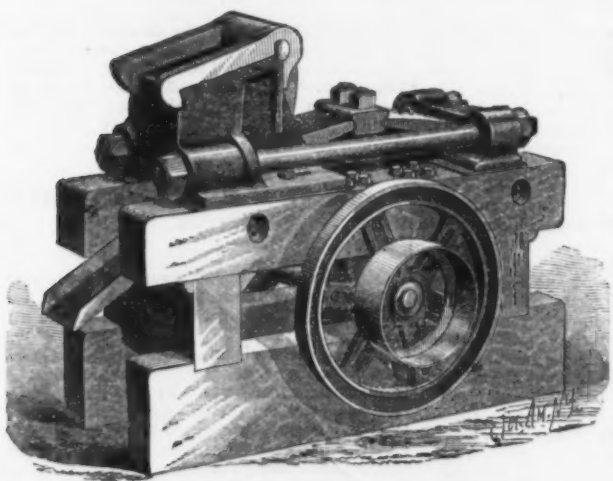
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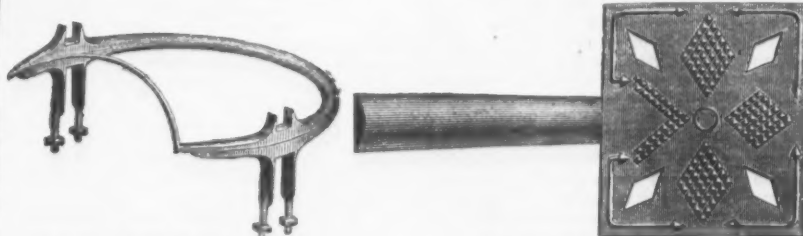
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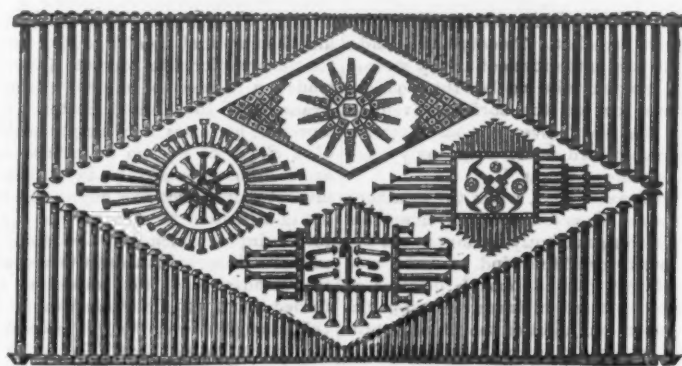
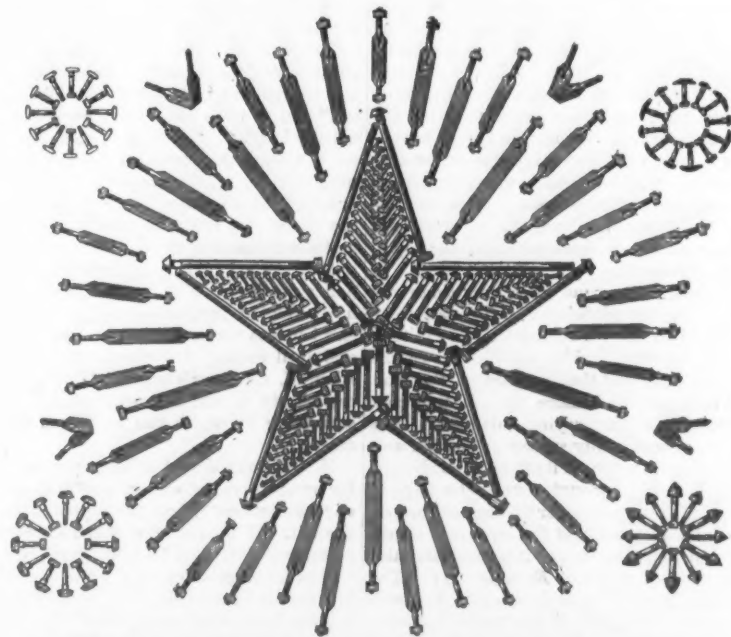
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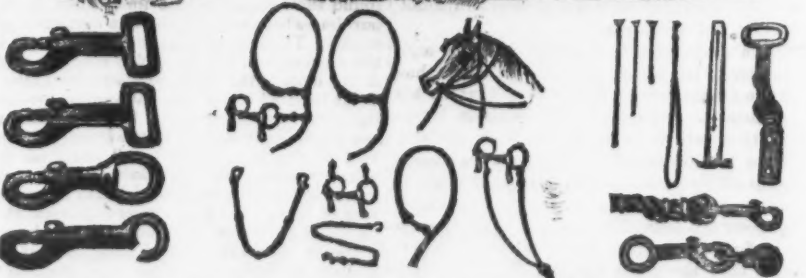
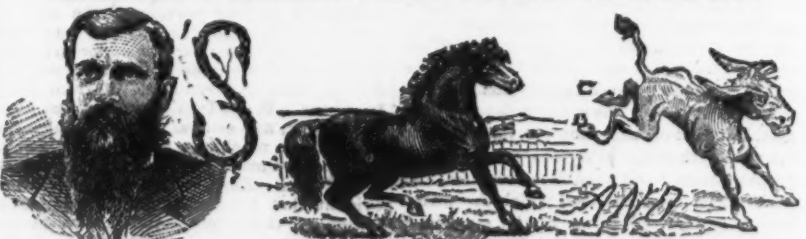
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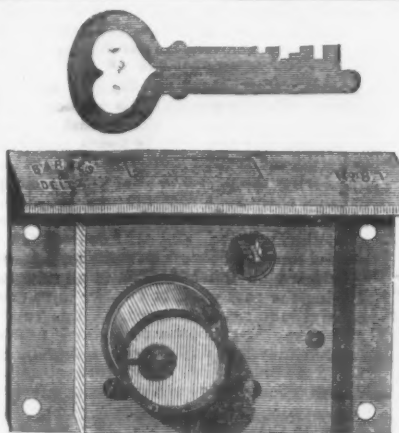
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Annual Review of the Metal Market for 1879.

It became evident as early as last year that an annual excess of exports over imports of between \$300,000,000 and \$400,000,000 would soon be productive of a lasting revival in business in the United States, and that metals, more depressed, comparatively speaking, than any other commodity, would be largely benefited by the favorable turn when it came. Most people in the metal trade, consequently, greeted the new year with confidence, the more so as the recovery which had taken place in the value of Tin had shown them how quickly a leading metal would be apt to rebound from extra depression if well concerted speculation, dormant during five long years, could be made to take courage once more. Yet, the more hopeful sentiment which pervaded the metal trade both in Europe and here was long kept subdued by the dismal aspect of European crops and the tariff reforms agitating Central Europe. When, later on, however, a revival in trade began to show simultaneously in England and France, and even stronger still in this country in consequence of the large gold receipts to pay for food, consumers, dealers and speculators prepared for a more active summer and fall campaign. In this they were singularly favored, as they all were by the extreme and undisturbed ease in money matters. The advance in values soon spread to most other articles beside metals, and a speculative fever spread among business men on both sides of the Atlantic, wilder than anything witnessed since the Franco-German war. It culminated in October, but as the year drew to its close speculation sobered down very much. Merchants began to reflect that, though the revival in the United States was justified, and likely to last, the elements favorable to its permanency were less abundant in Europe, where poor cereal crops and vintages, disastrous inundations and various social and agrarian problems threatened a severe winter season. But, even admitting these drawbacks, much has been gained. The world at large has recovered confidence, capital is ready to embark in useful enterprises, the United States and tropical countries obtain remunerative prices for what they produce, and have therefore become better markets for the world's manufactures, a circumstance which cannot fail to exercise a lasting beneficial influence upon the interests of industry in both hemispheres.

COURSE OF PRICES AT NEW YORK.—CENTS PER POUND.—IN GOLD.

	July 1, 1879.	July 1, 1879.	Jan. 1, 1880.	Nov. 1, 1879.
Lake Copper	24 1/2	24 1/2	24 1/2	24 1/2
Straits Tin	31 1/2	31 1/2	31 1/2	31 1/2
Domestic Lead	6 1/2	6 1/2	6 1/2	6 1/2
Spelter	7 1/2	7 1/2	7 1/2	7 1/2
Antimony	13 1/2	13 1/2	13 1/2	13 1/2
Coke Tin, pr bx \$5.00	12 1/2	12 1/2	12 1/2	12 1/2

Copper.

The year opened at 16¢ for Lake Superior Copper. The following statistics were published early in January: Stock brought forward from 1877, 7,500,000 lb. Production of Lake Superior Copper, 1878, 38,000,000 lb.; ditto from other mines, 8,500,000, giving a total production for 1878 of 46,500,000 lb. and a supply of 54,000,000 lb. The home consumption was 34,000,000 lb., including 4,000,000 lb. for cartridges for export, and the export of Ingot Copper, 13,000,000 lb., leaving a stock on the first of January, 1879, of 7,000,000 lb., against 7,500,000 on December 31, 1877. During the first three weeks of January a moderate business was done, sales aggregating 550,000 lb. at 16¢, but during the remainder of the month some important transactions took place to the extent of 5,000,000 lb., deliverable from February to May inclusive, bought by manufacturers at 15 1/2¢, January winding up with an additional sale of 100,000 lb. at the latter figure. At this time the Chilean statistics for 1878 reached us, showing that the total exports during the year were 46,950 tons, against 41,100 in 1877. The actual exports from Chili to November 13 1878 were 42,300 tons, against 38,416 in 1877, and 44,300 in 1876. The visible supply in England and France on January 1 was 48,474 tons, against 38,713 the previous year, and the price of Chili Bars, £58, against £66. The import into England in all 1878 decreased nearly 4000 tons, and the export increased 5000, while stocks of all descriptions showed an increase of some 10,000 tons. The inference drawn therefrom was that the constant decline had had the effect of causing consumers to operate from hand to mouth only, and that, therefore, their holdings were 20,000 tons less than usual. The real position of Copper on the other side was, therefore, a decidedly sound one from the very commencement of the year. Early in February some valuable statistics came to hand from England, showing that the amount of pure Copper estimated to have been extracted from pyrites in that country at 2 1/2¢ @ 3¢ had been 18,900 tons during 11 months of 1878, against 24,800 in all 1877, and 17,700 in 1876. In 1869 but 11,000 tons were thus obtained. The joint production of Chili, Australia and the United Kingdom in 1878 was estimated at 61,000 tons of pure Copper, against 59,500 tons in 1877. February proved a dull month, the joint sales not exceeding 500,000 pounds at 15 1/2¢. At this time a disconsolate notion gained ground in some economical circles in England to the effect that the depreciation in metals was a permanent affair, and the leading financial paper of London came out with a great article trying to prove that the depreciation experienced by most commodities was attributable to appreciation in the purchasing power of gold. Statistics reached us showing that reducing regulus, ore, &c., to pure Copper, the imports into the United Kingdom, in 1878, was 86,067 tons, against 91,309 in 1877, and 77,323 in 1876. In March the metal still remained in active sales, being limited to some 200,000 lb., at 15 1/2¢ @ 15 3/4¢, while Chili Bars still kept low in London, £55. 10/ @ £56, but began to attract more attention in view of the impending war between Chili, Peru and Bolivia. News came to hand of continued large copper production in Spain. In April, the actual outbreak of hostilities on the West Coast caused Chili Bars to temporarily improve 22

in London. The quieting assurance was simultaneously received from Buenos Ayres that the Argentine Republic would not participate in the struggle. Activity remained restricted at New York during the month, sales not exceeding 350,000 lb., at 15 1/2¢ @ 16¢, while Chili Bars stood £58 at London. In May it became known that in a quiet way some large transactions had taken place during the past few months to the extent of some 5000 tons Lake Superior for export at something like 14¢, 2000 of which had actually been delivered, while the remainder was to be taken during the ensuing three or four months. The knowledge of this fact, kept secret until then, caused manufacturers to at once secure between 3,000,000 and 4,000,000 lb., at 16¢, deliverable the next three months, 700,000 lb. Baltimore, at 15 1/2¢, and 650,000 lb. Lake Superior at 16¢ @ 16 1/2¢, the advances in London was lost, Chili Bars receding to £56. Nearly all the chief consumers being supplied, June proved a dull and featureless month, both on this side and in Europe, sales at New York being confined to 250,000 lb. at 16 1/2¢ @ 16 3/4¢, and London reporting no change. In July the usual midsummer dullness set in, sales being limited to 250,000 lb. at 16 1/2¢. Our copper export during the first six months of the year proved to have been 9,500,000 lb. Heavy charters on the West Coast, together with the failure of the Wallaroo sale in London, caused a weak feeling there and a drooping tendency in Chili Bars, which gave way to £53. 10/. The import into England during the first six months had been 49,923 tons, against 49,261 and 43,916 in 1878 and 1877, and the export 21,215, against 30,007 and 26,753. The Chilean exports and charters to July 27 had been 34,691 tons, against 29,483 in 1878, 29,653 in 1877 and 32,343 tons, showing a material increase where a decrease had been expected. In spite of all this, our manufacturers, anticipating a better sale for their goods, deemed it prudent to secure some more Copper while the price was low, and purchased 6,000,000 lb. in August at 16¢, deliverable from September to December inclusive, besides some stray lots for cash, together, 275,000 lb., at 16 1/2¢ @ 16 3/4¢. Meanwhile, the withdrawn Wallaroo Copper in England had been disposed of at private sale, and yet Chili Bars there did not stir from £54. In September more favorable views began to prevail on both sides of the Atlantic, leading to greater activity in cash sales and a gradual advance in prices. Thus some 975,000 lb. changed hands during the month at 16 1/2¢ @ 17 1/2¢, while London suddenly rose to £58. 10/. The unusually large amount of Lake Superior Copper absorbed by exportation, on the one hand, and the greater activity noticeable in our manufacturing regions on the other, began to stimulate speculation early in October in our own market, and under these combined influences prices were suddenly carried from 17 1/2¢ at the close of September to 21 1/2¢ a fortnight later, and remained so to the end of October, sales aggregating during the month 2,600,000 lb. on the spot. London meanwhile improved from £58 to £67 under the impulse of a great speculative movement. As was to be supposed, the excitement in October was followed by a less buoyant feeling in November, when it was shown that, although up to Nov. 1 the export last year had been only 11,500,000 lb., against 13,500,000 during the corresponding period this year, the November shipments in 1879 would not exceed 300,000 lb., against 800,000 in November, 1878, while a further decrease would, in all likelihood, occur in December. Our real export, according to these estimates, would, therefore, not be larger in 1879 than it was in 1878. On the other hand, it was calculated that since August our consumption had increased about 3,000,000 to 4,000,000 lb., while production remained about the same. Meanwhile, some 850,000 lb. of reshipped Copper had made their appearance from the other side. Purchases, nevertheless, were not inconsiderable, amounting to some 2,700,000 lb., at 21¢ @ 21 1/2¢, cash, and 22¢ deliverable in January to March, inclusive. Chili Bars kept fluctuating between £66 and £68. 10/ in the London market. In December the market developed little activity, sales during the month not exceeding 700,000 lb. Opening at 21¢ @ 21 1/2¢, prices kept steady, closing at 21 1/2¢ @ 21 3/4¢.

VALUE OF INNOT COPPER AT NEW YORK IN CURRENCY.—CENTS PER POUND.

	1873.	1874.	1875.	1876.	1877.	1878.	1879.
January	35	36	33 1/2	33 1/2	30 1/2	27 1/2	15 1/2
February	34 1/2	35	33 1/2	33 1/2	30 1/2	27 1/2	15 1/2
March	34 1/2	35	33 1/2	33 1/2	30 1/2	27 1/2	15 1/2
April	34 1/2	35	33 1/2	33 1/2	30 1/2	27 1/2	15 1/2
May	34 1/2	35	33 1/2	33 1/2	30 1/2	27 1/2	15 1/2
June	34 1/2	35	33 1/2	33 1/2	30 1/2	27 1/2	15 1/2
July	34 1/2	35	33 1/2	33 1/2	30 1/2	27 1/2	15 1/2
August	34 1/2	35	33 1/2	33 1/2	30 1/2	27 1/2	15 1/2
September	34 1/2	35	33 1/2	33 1/2	30 1/2	27 1/2	15 1/2
October	34 1/2	35	33 1/2	33 1/2	30 1/2	27 1/2	15 1/2
November	34 1/2	35	33 1/2	33 1/2	30 1/2	27 1/2	15 1/2
December	34 1/2	35	33 1/2	33 1/2	30 1/2	27 1/2	15 1/2

There have been exported from the United States during the first ten months 13,129,380 lb of Ingot Copper, against 11,512,555 lb during the corresponding period of 1878, and 10,913 cwt. of Ore, against 27,860, while the import of Ore was 10,326 cwt., against 4191 cwt.

Tin.

On January 1, Straits Tin, the only sort we shall quote in this review, stood in this city 14 1/2¢ @ 14 3/4¢, 261 in London and \$18.75 per picul, with an exchange of 3/7 1/2 at Singapore. The Banca sale of Dec. 26 had gone at 39.60 guilders the 50 kilos, equal to £67 in England. According to English estimates the supply of Tin for Europe in 1878 had been 30,161 tons, against 28,524 in 1877, and 29,511 in 1876. The average price of Straits had been £61. 10/ in London in 1878, £69 in 1877, and £74. 10/ in 1876. Early in the month some 25,000 slabs were afloat for the United States, of which about 10,000 arrived in January. The market meanwhile remained quiet and steady at the opening figure. Some additional statistics reached us from London making the world's supply of Tin in 1878, 35,493 tons, against 33,589 in 1877; in 1869 it had been 21,353. In February a gradual stiffening was noticeable in this market, with a fair amount of dealings, the price ranging between 14 1/2¢ and 15¢. The arrivals were 75,000 slabs Straits. London rose to £63, and Singapore to \$20.50 per picul. March continued to improve in price, more in response to the European market than from any increased demand there, rates

ruling from 14 1/2¢ to 15 1/2¢, closing at 15 1/2¢. The months' arrivals summed up some 3500 slabs Straits, the sales to 500 tons, there being afloat from the Straits for this country upward of 2000 tons. London improved to £64 and was subsequently carried to £69. April was characterized by quietness and great irregularity in prices. Opening at 15¢ @ 15 1/2¢, the latter gave way to 14 1/2¢ @ 14 3/4¢ toward the close, the arrivals summing up some 7500 slabs. The quantity of Tin on the way amounted at this time to some 3000 tons between Straits, Biliton and Australian. England had receded slightly, but soon recovered in response to the high Biliton rate. Large arrivals kept the month of May in a weak condition, prices declining from 14 1/2¢ to 14¢. Arrivals, some 17,000 slabs. In June a better feeling manifested itself, leading to considerable transactions of together about 750 tons Straits and Biliton, the arrivals meanwhile being some 13,000 slabs, and the price ranging between 14 1/2¢ and 15 1/2¢, the closing figure. There were now only 8000 slabs afloat from the Straits, being about half the quantity on the way the previous year at this time. Although the arrivals in July were light the market remained dull, owing to the heat and general inactivity in business circles. Information was received to the effect that thenceforward the Biliton sale would amount to 12,000 piculs, instead of 10,000 as heretofore. Opening at 15 1/2¢, the price gave way to 14 1/2¢ at the close. London, meanwhile, receding from £67 to £64. 10/. The depression was dispelled in August, both at New York and abroad, sales and resales here reaching about 600 tons, and the arrivals some 4000 slabs only. The price improved from 14 1/2¢ @ 15 1/2¢, while London rose from £64 to £69, and Singapore from \$20 to \$20.75. September was ushered in with the announcement of larger deliveries in England and Holland, and during August of some 1895 tons, causing prices to appreciate everywhere, in London to £74 and in Singapore to £23, while at New York we improved from 16 1/2¢ @ 17 1/2¢, the arrivals summing up to about 10,500 slabs. The position here was strengthened by a good jobbing demand. October proved a most exciting month in the Tin trade on both sides of the Atlantic; the advance realized, largely under the impulse of speculation, being from 18 1/2¢, the opening price, to 24¢, the closing figure at New York, from £73. 10/ to £98 in London, and from \$24.50 to \$30 at Singapore. The Biliton sale, which brought for 11,000 piculs 56.32 guilders per picul at Batavia, against 42.26 the previous one, contributed much toward the result. At the same time it was announced that next year (1880), the Netherlands Trading Society would offer but 60,000 piculs Banca. Arrivals at New York were 250 tons, sales 450 tons, including 2500 slabs Australian. The market closed dull, but brightened up again slightly early in November, when October deliveries in England and Holland were cable to have been 3000 tons, the usual monthly average being 1200 tons. In spite of large deliveries to actual consumption the reaction from an exaggerated advance had become inevitable, and made itself felt both in this country and abroad in all the month of November. The price opened at New York at 24¢, to decline gradually to 21 1/2¢, the closing figure, while London kept on fluctuating between £92 and £91 as extremes, winding up at £92. Singapore gave way from \$29.50 to \$26.50. The arrivals here were unusually large, 21,870 slabs. During December the market on this side displayed little animation and increased weakness, due more to general dullness in the metal trade than to any special causes. The price of Straits opened at 22¢. Receipts were large, considering the moderate demand prevailing, summing up some 15,000 slabs, while sales, all told, probably did not exceed 500 tons, the price gradually giving way to 20¢ @ 20 1/2¢, in order to close, with occasionally better London advices, at 20 1/2¢. The following shows the course of prices at New York:

STRAITS TIN.

	Sept. '78.	Oct. '78.	Nov. '78.	Dec. '78.	Jan. '79.	Feb. '79.	Mar. '79.	Apr. '79.	May '79.	June '79.	July '79.	Aug. '79.	Sept. '79.	Oct. '79.	Nov. '79.	Dec. '79.
1878.	13 1/2	13 1/2	13 1/2	13 1/2	13 1/2	13 1/2	13 1/2	13 1/2	13 1/2	13 1/2	13 1/2	13 1/2	13 1/2	13 1/2	13 1/2	13 1/2
1879.	13 1/2	13 1/2	13 1/2	13 1/2	13 1/2	13 1/2	13 1/2	13 1/2	13 1/2	13 1/2	13 1/2	13 1/2	13 1/2	13 1/2	13 1/2	13 1/2

The import of Tin into the United States during the first 10 months has been 6919 tons, against 4994 tons during the corresponding period of 1878. Shipments from the Straits settlements to the United States during the first 10 months proved to have been 93,855 piculs, against 51,827 during the corresponding period of 1878 and 53,913 in 1877.

Lead.

Prospects in the world's Lead markets early in the year were anything but encouraging. Production in Germany was notoriously larger; although somewhat less active in Spain, it was still considerable, while it was feared that the United States would again figure on the list with an enormous output. This being the general impression on both sides of the Atlantic, the tendency remained a drooping one most of the time during many months, only interrupted occasionally by some speculation for a rise always doomed to disappointment, till at length Lead was carried along in the general improvement which seized upon all the base metals without an exception. In the case of Lead it was favored by special causes then brought to light, contrary to expectations. The market opened at New York at 4¢ for Common Domestic, and English Pig at London at £14. 10/ @ £14. 15/. The month of January showed a fair amount of liveliness, sales figuring up some 1350 tons, the price gradually rising to 4 1/2¢. The Lead supply in the United States in 1878 had been 81,559 tons, against £79,549 in 1877. The export from London and Liverpool had been 12,260 against 17,419. February was an excessively dull month, sales being limited to 150 tons Refined at 4 1/2¢, and some trifling transactions in Common which realized between 4 1/2¢ and 4 3/4¢. In London, English Pig had risen to £15. 5/; in January it receded to £13. 10/ in all. February, caused by the resumption of production on an extensive scale in Spain, and great depression in values in the latter country, under apprehension of a large American output. March

was most stagnant, causing a rapid decline from the opening figure of 4 1/2¢ to 3 1/2¢ at the close, when the market steadied again and became much firmer. England began to recover and wound up the month at £14. 5/. In April more favorable accounts reached us both from Germany and Spain. In the former country consumption was reported to be considerably on the increase, while in the Peninsula production was at length falling off again. At New York the spring demand, meanwhile, began to develop on a liberal scale. The stock here early in April amounted to some 10,000 tons, the bulk of which was held by one strong party. The sales during the month summed up 3000 tons from 3.05¢ down to 2 7/8¢. London also became weaker as the month advanced. Early in May supplies were increasing once more, the stock being again 10,000 tons, with 2000 tons afloat and 10,000 tons in transit by rail, while manufacturers were supplied for a month or two. Speculators nevertheless again entered the market at 2 7/8¢ @ 3¢, and the sales aggregated for the month some 4350 tons, part cash and part June-July delivery. Statistics reached us from Europe showing that the world's production had from 268,000 tons in 1860 declined to £13, to recover toward the close to £13. 17/6. In June views respecting the Leadville supply became somewhat modified. The metal trade began to perceive that it would not be in 1879 anything like what had been supposed would be the case. This altered position of Leadville as a source of supply during the year exercised a still more powerful influence later on. At all events, our market soon righted amid considerable dealings, the sales reaching 3050 tons, beginning at 3 1/2¢ and ending at 3.80¢. London remained steady at £13. 15/. July opened with a stock not exceeding 8000 tons, with the spot demand at hand, and prices were thus allowed to gradually recover from 3.80¢ at the commencement of the month to 4.05¢ at the close, sales summing up some 1900 tons. London remained dull but steady at £13. 10/. In August it was announced that the Leadville production during the previous month had not exceeded 1000 tons, of which but 300 tons reached this city. The month was stiffer, but, on the whole, not very active; sales reached some 2200 tons, all sold in a single week at 4¢, the month closing firm at 4 1/2¢. An advance was also cabled from London, where large purchases had been effected for Continental account, English Pig recovering to £14. 15/. September was ill sustained till the last week of the month, when at 3 3/4¢ @ 3.85¢ manufacturers re-entered the market. Total sales of the month, 1200 tons at 3 3/4¢ @ 4 1/2¢. The price in London had in the meantime given way £1. The ever-memorable month of October also came to the assistance of the Lead market, causing a notable rebound. The month was inaugurated with large purchases by consumers at 4¢ @ 4 1/2¢, and prices gradually rose to 5 1/2¢, the closing figure being 5¢, and sales aggregating 3800 tons. London recovered to £16. Statistics reached us showing that Spanish export during the first six months had been 45,536 tons, against 47,315 in 1878. Great Britain's import during the first 9 months had been 74,875 tons in 1879, against 75,306 in 1878, and the export 29,376, against 26,812, of which London and Liverpool alone exported 6309, against 10,011 in 1878, and 13,249 in 1877. Although there was much less doing in November, the market was kept in a strong position by the well known fact that the Eureka and Richmond companies had been reducing their output during the past few months. Sales made during the month, 1700 tons, at 5¢ @ 5 1/2¢ for Common, and 5 1/4¢ @ 5.85¢ for Refined. London rose to £17. 5/. The export from London and Liverpool during the first 11 months had been 9359 tons in 1879, against 12,802 in 1878. Although the demand in December was but moderately active, great firmness was established as the month advanced. The same may be said of the London market, which kept steady at £18 for English Pig, in response to the formation of a Continental syndicate to uphold the price of the metal. Sales during the month amounted to some 2400 tons. The price opening at 5 1/2¢, gradually improved to 5 1/4¢, the closing figure.

PRICE OF COMMON DOMESTIC LEAD AT NEW YORK.—CENTS PER POUND.

	1877.	1878.	1879.
January	6 1/2	6 1/2	4 1/2
February	6 1/2	6 1/2	4 1/2
March	6 1/2	6 1/2	4 1/2
April	6 1/2	6 1/2	4 1/2
May	6 1/2	6 1/2	4 1/2
June	6 1/2	6 1/2	4 1/2
July	6 1/2	6 1/2	4 1/2
August	6 1/2	6 1/2	4 1/2
September	6 1/2	6 1/2	4 1/2
October	6 1/2	6 1/2	4 1/2
November	6 1/2	6 1/2	4 1/2
December	6 1/2	6 1/2	4 1/2

Import of Lead into the United States during the first ten months of 1879, 964 tons, against 593 in 1878; foreign export, 38 tons, against 380; domestic export, \$64,972 worth, against \$47,285. The total production in the United States during 1879 was, toward the end of the year, estimated by the best authorities at between \$5,000 and 90,000 tons.

Spelter.

The production of Spelter during the past 10 years was known to have increased very much, not only in Silesia, where it has risen some 50%, but in England, from Spanish calamines. Meanwhile the United States had become pretty independent as regards the supply of this metal. Building, up to the spring of 1879, not being active either in Europe or this country since 1873, consumption did not apparently make sufficient headway against the thus increased output, and the consequence was a decline altogether unprecedented, till gradually, in the course of the year under review, these circumstances underwent a favorable change, leading to a recovery as sudden as it came unexpected. The metal was thus allowed to take its full share in the general improvement which has signaled the summer and fall of 1879, placing the entire Spelter industry once more on a footing of great promise. The month of January opened with a dull feeling at 4 1/2¢ @ 4 3/4¢ for Common Domestic, when toward the close makers joined in a combination to sustain prices, causing rates to recover slightly, closing at 4 3/4¢ @ 4 1/2¢. London opened at £16. 10/

for Silesian and £12. 10/ for hard. News reached us that the Central European markets were flooded with Common Refined at very low rates. February passed featureless in our market, without change in prices. Hard in London gave way to £12. Sheet Zinc was selling at New York since the beginning of the year at 6 1/2¢ @ 6 3/4¢. In March there was again quite a moderate trade at 4 1/2¢ @ 4 3/4¢. London dropped to £15. 10/ @ £15. 15/ with Silesian. In April there was a little more doing, and in one week some 150 tons changed hands at 4 1/2¢ @ 4 3/4¢, the month closing at 4 1/2¢ @ 4 3/4¢. The April demand was also slightly better in Europe. May was quiet once more, the price receding by degrees to 4 1/2¢ @ 4 3/4¢, while London reported a most unsatisfactory state of affairs there. In June rather more favorable advices reached us from Missouri, where some smelting establishments had stopped operations. The demand being limited here, a dragging market kept prices unimproved at 4 1/2¢ @ 4 3/4¢. In London, Silesian opened the month of June at £14. 10/ @ £14. 17/6, and Hard at £11, with a very slack demand. In July a diminished ore supply was reported from Missouri, and a firmer feeling ruled in our market in consequence, causing prices to gradually appreciate a little, winding up the month at 4 1/2¢ @ 4 3/4¢. From the Continent of Europe rather less discouraging accounts came dropping in, the shipments from the Silesian mountains being stopped for the time being. Toward the end of the month London stood with Silesian £13. 17/6 @ £14, and with Hard £11. In August a good deal of animation developed in our market, leading in a single week to sales of some 300 tons at 5¢ @ 5 1/2¢, the closing figure being 5 1/2¢ @ 5 3/4¢. The stock at New York at this time had dwindled down to 400 to 500 tons, and in the West stocks were notoriously light. An important step had meanwhile been taken by European producers, who formed a powerful syndicate to raise prices and keep them above a certain level to the end of 1880. When this was divulged both in London and New York these markets reopened promptly, Sheet Zinc being raised here to 7 1/4¢ @ 7 3/4¢, and London making a jump of a couple of pounds after opening the month at £15 with Silesian. The improvement here made some further progress in September, after some sales at 5 1/4¢, the month winding up at 6¢ @ 6 1/2¢, while London rose to £18. 15/ @ 19 with Silesian and £14 with Hard. There being a steady consumptive demand while the scarcity continued, a further rise ensued, carrying Common Domestic to 6 1/2¢, and Sheet Zinc to 8 1/4¢. The importation of Silesian Spelter had now to be resorted to, the same selling at 6 1/2¢ @ 6 3/4¢, and arriving in quantities sufficient to prevent any further advance in the value of the Domestic article, which, on the contrary, receded a little during the following month of November, when it gave way to 6 1/2¢ @ 6 1/4¢, at which figure the month, however, closed firm, in view of the raising of Silesian selling limits 1/4¢. The demand out West, moreover, proved sufficiently large to pretty much absorb the output there. The month of December was generally dull, and the price of Common Domestic weak at 6¢ @ 6 1/4¢, Silesian remaining firm at 6 1/2¢ @ 6 3/4¢, with little offering. Prices in Europe have continued upward during the month, and Silesian gradually rose to £20. 2/6 @ £20. 5/ in the London market.

LOWEST AND HIGHEST PRICE OF COMMON SPELTER.—CENTS PER POUND.

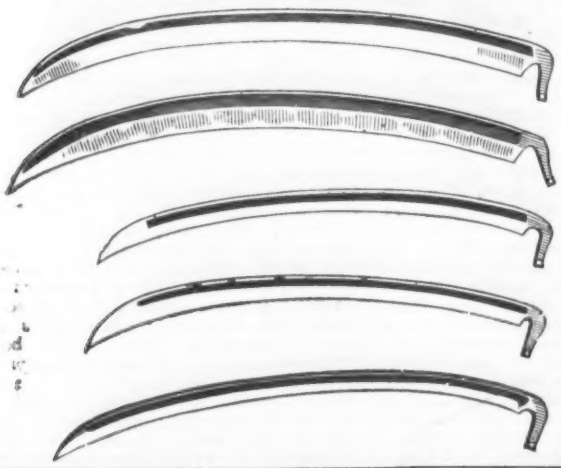
	1877.	1878.	1879.
January	6 1/2	6 1/2	4 1/2
February	6 1/2	6 1/2	4 1/2
March	6 1/2	6 1/2	4 1/2
April	6 1/2	6 1/2	4 1/2
May	6 1/2	6 1/2	4 1/2
June	6 1/2	6 1/2	4 1/2
July	6 1/2	6 1/2	4 1/2
August	6 1/2	6 1/2	4 1/2
September	6 1/2	6 1/2	4 1/2
October	6 1/2	6 1/2	4 1/2
November	6 1/2	6 1/2	4 1/2
December	6 1/2	6 1/2	4 1/2

The import of Spelter into the United States during the first ten months has been 1,670,574 pounds, against 1,008,744 during the same time in 1878; of Sheet Zinc, 1,728,016 pounds, against 752,473; the export of Domestic Spelter has been 983,160 pounds, against 2,554,249, and of Ore, 517 tons, against 635.

Tin Plates.

Early in January the average price of ordinary Tin Plates stood, at New York, \$5.33 per box. Ordinary Charcoal commanded 18/6 @ 19/ at Liverpool; ditto Terne, 17/ @ 18/ and Coke, 16/ @ 16/6. The month was both active and strong, some 10,000 boxes, mostly Coke, selling here in a single week. The demand in England for abroad was on the increase, and the tendency upward. February opened at \$5.70 average, while in England the price had improved to 22/ for Charcoal, 18/ for Terne and 17/6 for Coke, to give way about 1/ subsequently. A good many Western orders were received at New York, and when they had been filled a lull ensued. March, nevertheless, again opened a little higher, the average being \$5.75, but greater ease soon followed, with a simultaneous slackening off in England. The January and February export from Great Britain to the United States

BEARDSLEY SCYTHE COMPANY, West Winsted, Conn.



Manufacturers of the well-known brands of
German Steel, Cast Steel and Silver
Steel Grass Scythes.

ALSO THE
Clipper, Emperor, Beardsley's Golden Trimmer,
Conqueror, Dutchman, Waldron, &c.

ALSO
Silver Steel, Clipper & Harvest Victor Grain Scythes,
Common Pattern & Spear Point Hay Knives.

ALSO
Corn Knives, Bush & Weed Scythes.

A. F. PIKE,

East Haverhill, NEW HAMPSHIRE
(ESTABLISHED 1823.)

HEADQUARTERS FOR SCYTHE, AXE, KNIFE,
HACKER AND TOOL STONES.



Twenty Quarries and Four Factories in New
Hampshire and Vermont.

Strong, Clear Grit Stone
that will not glaze.

PRICES & QUALITY GUARANTEED
All Goods Genuine Brands.

My customers may rely upon being squarely
dealt with and getting no poor, unsalable im-
itations.

LIST.

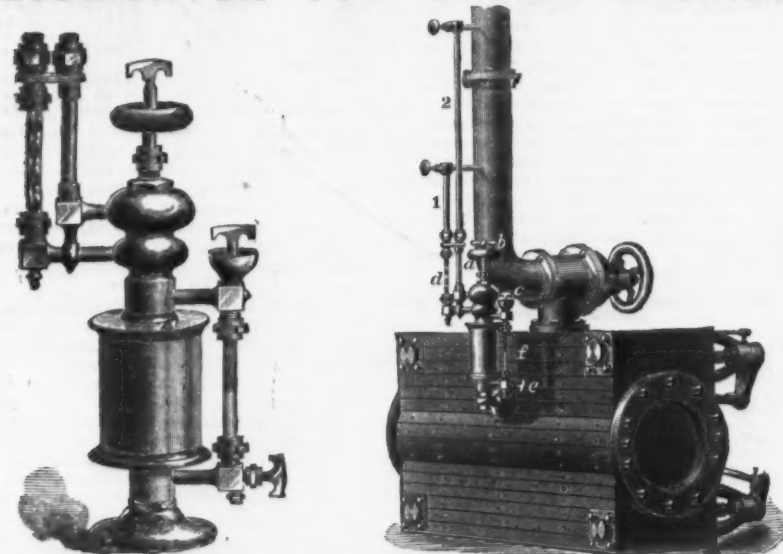
No. 1, Extra Indian Pond.
No. 2, " " " "
Premium.
Union.
White Mountain.
L'Étoile.
Diamond Grit.
Hacker (Round).
Lamotte.
Willoughby Lake.
Green Mountain.
Black Diamond.
Rag.
Mowing Machine.
Paper Mill Stone.
Vermont Dabry.
Chocolate.
Axe Blitts.
N. H. Chocolate.
German Pattern.

The only Manufacturer of Gen-
uine, Old Reliable Indian
Pond (Red End).

Stones manufactured, labeled and branded in
any manner desired.

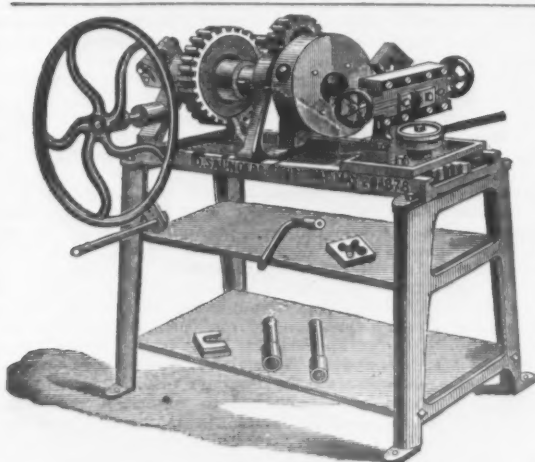
Beware of Coarse, Brittle Imitations.

**HARPER'S
LUBRICATOR FOR STEAM ENGINES.**



This invention is an improvement upon that class of Lubricators in which the lubricating material is floated from the reservoir by the condensed steam passing into the reservoir, and may be applied to all kinds of Steam Engines, by introducing the Lubricator into the steam pipe so that it thoroughly lubricates and prevents the wear of cylinder, piston, valves and rods, thereby saving oil, coal and packing, and adding greatly to the easy working of the Engine. The ultimate saving in repairs to the engine is many times greater than the cost of Lubricator. The glass tube connected with the reservoir indicates the quantity of oil in the reservoir; the upper glass tube the quantity of oil escaping. The quantity of oil admitted to the engine can be regulated with certainty. We might claim great economy of oil; that we leave with the Engineer. This invention is in practical operation, and is very highly recommended by the best engineers, and all now using it. This invention is secured by Letters Patent of the United States, dated Sept. 25, 1871, and April 4, 1877. Information concerning the Lubricator may be obtained from our Agents, or by addressing

THE HARPER STEAM LUBRICATOR CO., Westville, Conn.



Saunders' Sons'

NEW
PIPE-THREADING
MACHINE,

FOR
Hand or Power,
The I X L.

Manufacturers of
Steam and Gas Fitters' Tools,
Pipe Cutting and
Threading Machines,
for Pipe Mill use, &c., a specialty.
Yonkers, N. Y.
Send for circulars.

GREENFIELD TOOL CO.

(GREENFIELD CUTLERY CO.)

Greenfield, Mass., U. S. A.,

MANUFACTURERS OF



Fine Table Cutlery.

Solid Handled, Bone, Ivory, Rubber and Wood, Solid Steel Silver Plated.



PATENT CONCAVE FORGED OX SHOES.

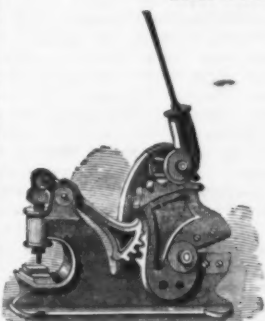


ALSO,

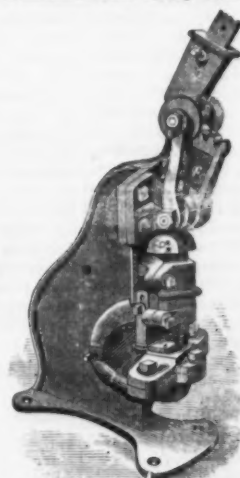
PLANES, PLANE IRONS, &c.

G. B. WALBRIDGE,

No. 103 Chambers St., New York.



Combination Punch and Shears.
Cuts Round and Flat Iron.



Punch $\frac{1}{4}$ to $\frac{1}{2}$ in., $\frac{1}{2}$ in. Plates.



Shears for Plates and Bars

SOLE
MANUFACTURER OF

**Lyon's Patent Hand and Power
DRILLS, SHEARS AND PUNCHING PRESSES.**

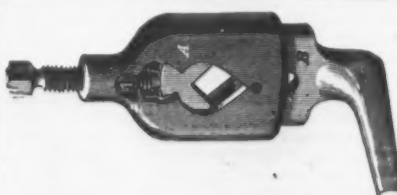
For Workers in Iron and Steel, adapted to all trades.
Send for circular and prices.

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**DEXTER
CARRIAGE SPRING**

Combines
Strength,
Durability,
Beauty. Light and Easy.

The DEXTER SPRING is the most perfect Carriage Spring ever invented. Wherever it is known it is rapidly superseding all others for pleasure vehicles. It is especially recommended for use on the rough roads of new countries, as its peculiar construction relieves the strain on the vehicle and shock to the passenger, while the high grade of material used reduces the probability of breakage to a minimum. For circulars, prices, &c., address

DEXTER SPRING CO., Hulton, near Pittsburgh, Pa., U. S. A.



NORTH'S PATENT

Universal Lathe Dog.

It is very strong. Holds very strong. Will not deface finished work. Holds round, square or irregular work. Always stands up square with the work and will not "skew." Is more evenly balanced than the common dog. Send for circular.

SELDEN G. NORTH, No. 347 North Fourth Street, Philadelphia, Pa.

BAEDER, ADAMSON & CO.,
Manufacturers of SAND & EMERY PAPER & EMERY CLOTH.
(Also in Rolls, for machine work.)

Ground Emery, Corundum & Flint, Glue & Curled Hair, Hair Felt, & Felt-
ing for Covering Boilers, Pipes, &c., Cow Hide Whips.
Stores: PHILADELPHIA, 730 Market St., CHICAGO, 143 N. La St.,
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ESTABLISHED 1858.



The original and only Genuine Starwood
Pumps, with or without Porcelain Cylinders.
Tubing, Fave Trough and sole manufacturers of
the Champion Improved Wind Mill.
Sold by the trade generally.
Send for catalogue and prices.

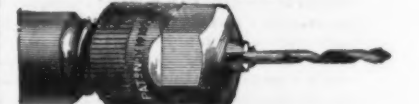
POWELL & DOUGLAS,
Waukegan, Ill.

THE BEST ARE THE CHEAPEST!



The Trump Lathe Chucks,

Three Jaws, Self-Centering.
Equal to the best. For drills $\frac{1}{2}$ and under.
Price, \$1.50 to \$2.25.



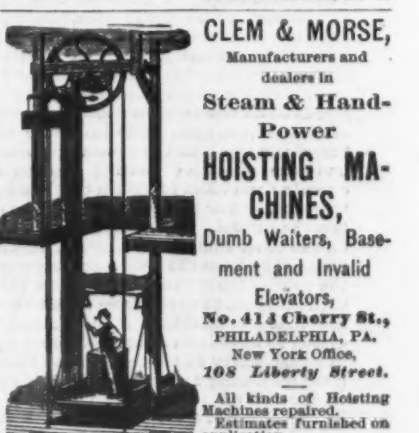
Trump Bros. Machine Co.,
Send for circulars. Wilmington, Del., U. S. A.

**SIBLEY'S
IMPROVED LEVELING INSTRUMENT.**



Mounted Complete. Price, \$10.
Trade supplied with one or two instruments at a
fair discount. When ten or more instruments in all
are ordered, a special discount will be given from the
first. Catalogue containing full directions mailed on
application.

BICKNELL & COMSTOCK, Proprietors,
27 Warren St., N. Y.



CLEM & MORSE,
Manufacturers and
dealers in

Steam & Hand-
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**HOISTING MA-
CHINES,**

Dumb Waiters, Base-
ment and Invalid

Elevators,
No. 413 Cherry St.,
PHILADELPHIA, PA.

New York Office,
108 Liberty Street.
All kinds of Hoisting
Machines repaired.
Estimates furnished on
application.



**Flanders' Improved Locomotive Cylin-
der Boring Machine.**

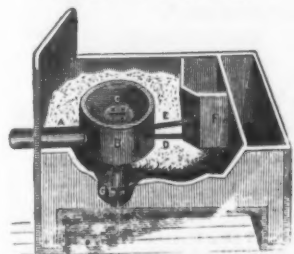
Bar and screw of cast steel, with two extra cutter
heads. Manufactured and for sale by the
L. B. FLANDERS MACHINE WORKS,
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SABIN MFG. CO.,

MONTPELIER, VT., Manufacturers of
Double-Acting Spring Butts,
Sabin's Lever Door Springs,
For heavy doors,
Boss and Crown Springs,
For light doors.

Send for Catalogue.

BAYLISS' HOT BLAST WATER TUYERE Hurricane Bellows 'LITTLE GIANT' AND FORGE.



The side of the forge is broken away to show the construction of the TUYERE.

This Tuyere can be placed in any Forge, with or without water. This Tuyere has been in use for the past ten years, has stood the test, and exceeds by far any made at the present time.

These Tuyeres and Forges have obtained for the last ten years the first premium, the medals of special award and superiority and diplomas of maintained superiority at the American Institute Fairs.

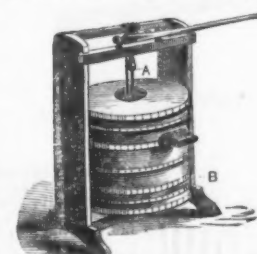
I respectfully refer to the following order:

Mr. JOHN BAYLISS:

Dear Sir:—Please send us at once Ten Tuyeres, small size.

BAYLISS & CO., of Broome st., Broadway, 4th to 5th sts., N. York.

These Tuyeres are used exclusively in the above establishment.



A 30-inch Bellows, No. 4, is equal to a 40-inch pear-shaped Bellows, and a boy of 5 years can work them.

Copy of the Judges' Report in Department V, Group 2, at the 43rd Exhibition of the American Institute, held in the City of New York, October, 1876, No. 661.—Blacksmith's Triple Action Cylindrical Bellows.

John Bayliss, No. 147 East 24th st., New York. That a comparison and an actual test of the above named bellows in competition with the Fan Blowers exhibited in the same group convinces your judges that for Blacksmith's use the bellows is not only far superior to the hand blowers exhibited and desired to be used for the same purpose, but that it is superior also to bellows heretofore used. We regard it as a decided advance in the art, and unanimously recommend it for the highest award your board for such exhibits.

Silver Medal Awarded.



Portable Forge and Bellows.

They are especially adapted for Railroads, Ship, Steam Boiler, Carriage, Bridge Building, Horse Shoers, Jewelers, Pipe Fitting and Locksmiths.

There are three sizes, the cut representing the smallest size.

No. 2 will heat to a welding heat in 2 1/2 minutes, and do any work up to 2 1/2 inches square iron equal to any forge of larger size.

Send for Circulars and Price List.

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This knife is the best in use for cutting down hay and straw in mow and stack, cutting fine feed from bale, cutting corn stalks for feed, cutting peat and ditching marches.

The blade is best cast steel, spring temper, easily sharpened, and is giving universal satisfaction. A few moments' trial will show its merits, and parties once using it are unwilling to do without it. Its sales are fast increasing for export as well as home trade, and it seems destined to take the place of all other Hay Knives.

They are nicely packed in boxes, one dozen each, of 50 lbs. weight, suitable for shipping by land or water to any part of the world.

Manufactured only by

HIRAM HOLT & CO.,

East Wilton, Franklin Co., Maine.

For sale by the Hardware Trade generally.

ESTABLISHED 1836.

SHELTON & CO.,

Manufacturers of every variety of

TACKS & SMALL NAILS.

Carriage, Tire, Machine, Plow, Stove and Spring Bolts, Coach and Bed Screws, &c.

BIRMINGHAM, CONN.
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SCALES.

Cuts of a few goods made by

JOHN CHATILLON & SONS, NEW YORK, U.S.A.

shipments to all quarters aggregated 57,758 tons, against 47,707 in 1878, and 48,257 in 1877; of these to the United States alone 44,226 tons, against 32,993 and 32,505 respectively. June opened here at an average of \$5.43, and a decidedly improved feeling in response to a similar one on the other side. A fair amount of business was transacted during the month. The shipments from the United Kingdom to the United States during the first five months proved to have been 56,001 tons, against 41,992 in 1878, and 43,037 in 1877. July opened with a buoyant tone, at the average of \$5.50, the demand running principally on Terns for roofing purposes, while Coke Tin was neglected. A good deal was also done deliverable in three months. In Wales four days' work were agreed upon. Meanwhile Coke had dropped, during a dull spell, to 15/6 in Liverpool, whence the shipments, during the first six months, to American ports had been 870,000 boxes, against 807,345 in 1878. From the United Kingdom to all quarters they had been 91,224 tons, against 76,324 in 1878, and 77,233 in 1877; of these there went to the United States, alone in 1879, 68,780 tons, equal to 1,350,000 boxes. Considering the season, August was inaugurated with a very good demand indeed, and at an average here of \$5.40, certainly a very low price, well calculated to attract buyers. In England an advance of 1/10 took place, Coke being worth 16/ at 16/6. The shipments from Liverpool to American ports during the first seven months were 1,011,315 boxes, against 927,101 in 1878, 951,047 in 1877 and 803,448 in 1876; from Great Britain to the United States, 81,860 tons, against 62,476 and 61,857, an increase of something like 31%. September developed increased activity, opening at \$5.57 average. The demand was general and well sustained. Middle of September makers in Wales resolved to work five days. The tendency in England had become a decidedly upward one in consequence of the important advance in Block Tin and Pig Iron. In spite of the enormous shipments this way, October opened with quite a light stock at New York, and an average of \$6.66. While the month progressed the demand from the trade, consumers and speculators was becoming a more and more pressing one, and after a while a wild state of affairs prevailed, Tin Plates catching the contagion of the general mania, which had temporarily seized upon the commercial classes on this side. Toward the close of the month, while the speculative demand subsided, the trade demand even increased. Deliveries from the other side remained very much backward. In England, under the impulse of the news from here, an important advance took place, Charcoal rising from 23/ at 24/ to 28/ at 30/, and Coke from 20/ to 24/ at 25/. November opened in a more quiet mood in this city, with an average price for ordinary brands of \$7.28. Speculation had disappeared for the time being, but the consumptive demand remained all that could be wished for, causing holders not to press their goods on the market, thus maintaining the latter moderately active, but firm. Work in England was now four days per week, with a probability of full work on Jan. 1 in prospect. Prices there declined to 27/6 at 28/6 for Charcoal and 24/ for Coke. The market remained active in December; large sales, deliverable during the first quarter of the new year, were effected at gradually rising prices, the average value of ordinary brands at the close being \$7.50.

The definition of trade-mark contained in the Political Code of California is copied into the Penal Code of Dakota, approved February 7, 1877, Sec. 415 (see Sec. 576 Civil Code); so also are the provisions of the Penal Code of California in reference to counterfeiting trade-marks, and selling goods bearing such counterfeits (Secs. 411 and 413). The punishment, however, is imprisonment in the county jail not exceeding one year or fine not exceeding \$500, or both. Other sections of the act, i. e., Sec. 412, against keeping dies, plates, brands or imitations of trade-marks for the purpose of making counterfeits, &c., and Sec. 414, against affixing any imitation of a trade-mark which is the same to the eye or the ear as the genuine, are the same as the acts of Missouri and New York, except in phrasing.

The punishment is the same as prescribed in Secs. 411 and 413, except that the person offending under Sec. 414 "is liable to the party aggrieved in the penal sum of \$100 for each and every offense, to be recovered by him in a civil action."

Sections 418 and 419 provide for the punishment of persons refilling or selling bottles, or keeping same without consent, the marks of which had been recorded according to law, by a penalty of 50 cents for each offense, and every bottle filled, bought or sold for first offense, and \$5 each for every subsequent offense. Section 420 provides for proceedings to obtain search warrant in cases mentioned in Secs. 418 and 419, and for the summary trial of the offender, when brought before the magistrate, and fine as prescribed.

The Civil Code, Sec. 160, declares that there may be ownership in trade-marks. In Illinois, in addition to the laws already given, on March 27, 1874, there was approved "An act to revise the law in relation to criminal jurisprudence," which contains the following sections:

"Section 115. Whoever knowingly and willfully counterfeits, or causes to be counterfeited, any private stamp, label or trade-mark used by a merchant or manufacturer about the sale of his goods, with intent to defraud the purchaser or manufacturer, or sell such goods with such counterfeit stamps, labels or trade-marks thereon, knowing them to be counterfeit, shall, for each offense, be fined not exceeding \$200."

"Section 116. When a person uses any peculiar name, letters, mark, device, or figures out, stamped, cast or engraved upon, or in any way attached to or connected with, any article manufactured or sold by him, to designate it as an article of a peculiar kind, character or quality, or as manufactured by him, whoever shall, without his consent, use the same or any similar names, letters, marks, devices or figures, for the purpose of falsely representing any articles to have been manufactured by him, or to be of the same kind, character or quality as that manufactured or sold by the party rightfully using the same, shall, for each offense, be fined not exceeding \$200."

In Kansas "An act (took effect May 31, 1866) to prevent the counterfeiting, changing or destroying trade-marks, devices and brands:"

"Section 1. If any person or persons shall willfully change, alter, deface, destroy, counterfeit, cut out or dispose of any trade-mark, brand, impression or device used by any person, company or corporation within this State, to designate a particular description of goods, wares, merchandise, case, barrel, half-barrel, keg, bottle, package, or the contents thereof, he or they shall forfeit and pay to the owner or owners thereof, for each offense, not exceeding the sum of \$25, to be recovered in any court proper to try the same, or before a justice of the peace having jurisdiction of same."

"Section 2. If any person shall change, shift and place any brand, mark or device used or intended to be used for the purpose of passing off any goods to which such forged mark is affixed as the genuine goods, and thereby avail himself of another person's brand, mark or device, he shall forfeit for every offense the sum of \$25, to be recovered as above."

Sections 186 and 187 of the Penal Code of Utah (Compiled Laws of 1876, p. 608) provide that every person who willfully forges or counterfeits a trade-mark with intent to pass off any goods to which such forged mark is affixed as the genuine goods, and "every person who sells or keeps for sale any goods upon which such counterfeited trade-mark has been affixed, intending to represent such goods as the genuine goods of another, knowing the same to be counterfeited, is guilty of a misdemeanor."

Section 190 provides that every person who has or uses any bottle or other thing bearing the duly filed trade-mark or name of another, for the purpose of disposing, with intent to deceive or defraud, of any article other than that which such bottle, &c., originally contained, is guilty of a misdemeanor. By Section 17 of the Penal Code a misdemeanor is punishable by imprisonment in a county jail not exceeding six months, or by a fine not exceeding \$300, or both.

The definition of trade-mark contained in the Political Code of California is copied in section 189 of the Penal Code of Utah.

The foregoing abstract of the laws of the States is the best argument in favor of a uniformity of action among all trade-mark owners. Particular classes of trade-mark owners have obtained special protection, e. g., manufacturers and vendors of mineral water and other beverages, flour, watches, wines, &c. But these laws only exist in a few States. Marks on watches are protected by an act in Massachusetts; marks

A Patent Case Decided.—A patent case between Buffalo parties has been brought to a conclusion before Judge Blatchford in his chambers in New York during the past week. It is the case of John Weeks agt. The Buffalo Scale Co., the testimony in which was taken during the past summer and fall before Mr. George J. Sicard as examiner. The suit was for infringement of letters patent granted the plaintiff for an improvement in scale beams. The argument of the case before Judge Blatchford occupied three

days, and the Judge sustained the validity of the plaintiff's patent and held that the defendant had been guilty of infringement. The case was argued by Hon. E. C. Sprague and E. B. Perkins for defendant, and James A. Allen for plaintiff.

General Summary of the Trade Mark Laws of the States of the United States.*

BY FRANCIS FORBES.

(Concluded.)

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Sections 418 and 419 provide for the punishment of persons refilling or selling bottles, or keeping same without consent, the marks of which had been recorded according to law, by a penalty of 50 cents for each offense, and every bottle filled, bought or sold for first offense, and \$5 each for every subsequent offense. Section 420 provides for proceedings to obtain search warrant in cases mentioned in Secs. 418 and 419, and for the summary trial of the offender, when brought before the magistrate, and fine as prescribed.

The Civil Code, Sec. 160, declares that there may be ownership in trade-marks. In Illinois, in addition to the laws already given, on March 27, 1874, there was approved "An act to revise the law in relation to criminal jurisprudence," which contains the following sections:

"Section 115. Whoever knowingly and willfully counterfeits, or causes to be counterfeited, any private stamp, label or trade-mark used by a merchant or manufacturer about the sale of his goods, with intent to defraud the purchaser or manufacturer, or sell such goods with such counterfeit stamps, labels or trade-marks thereon, knowing them to be counterfeit, shall, for each offense, be fined not exceeding \$200."

"Section 116. When a person uses any peculiar name, letters, mark, device, or figures out, stamped, cast or engraved upon, or in any way attached to or connected with, any article manufactured or sold by him, to designate it as an article of a peculiar kind, character or quality, or as manufactured by him, whoever shall, without his consent, use the same or any similar names, letters, marks, devices or figures, for the purpose of falsely representing any articles to have been manufactured by him, or to be of the same kind, character or quality as that manufactured or sold by the party rightfully using the same, shall, for each offense, be fined not exceeding \$200."

In Kansas "An act (took effect May 31, 1866) to prevent the counterfeiting, changing or destroying trade-marks, devices and brands:"

"Section 1. If any person or persons shall willfully change, alter, deface, destroy, counterfeit, cut out or dispose of any trade-mark, brand, impression or device used by any person, company or corporation within this State, to designate a particular description of goods, wares, merchandise, case, barrel, half-barrel, keg, bottle, package, or the contents thereof, he or they shall forfeit and pay to the owner or owners thereof, for each offense, not exceeding the sum of \$25, to be recovered in any court proper to try the same, or before a justice of the peace having jurisdiction of same."

"Section 2. If any person shall change, shift and place any brand, mark or device used or intended to be used for the purpose of passing off any goods to which such forged mark is affixed as the genuine goods, and thereby avail himself of another person's brand, mark or device, he shall forfeit for every offense the sum of \$25, to be recovered as above."

Sections 186 and 187 of the Penal Code of Utah (Compiled Laws of 1876, p. 608) provide that every person who willfully forges or counterfeits a trade-mark with intent to pass off any goods to which such forged mark is affixed as the genuine goods, and "every person who sells or keeps for sale any goods upon which such counterfeited trade-mark has been affixed, intending to represent such goods as the genuine goods of another, knowing the same to be counterfeited, is guilty of a misdemeanor."

Section 190 provides that every person who has or uses any bottle or other thing bearing the duly filed trade-mark or name of another, for the purpose of disposing, with intent to deceive or defraud, of any article other than that which such bottle, &c., originally contained, is guilty of a misdemeanor. By Section 17 of the Penal Code a misdemeanor is punishable by imprisonment in a county jail not exceeding six months, or by a fine not exceeding \$300, or both.

The definition of trade-mark contained in the Political Code of California is copied in section 189 of the Penal Code of Utah.

The foregoing abstract of the laws of the States is the best argument in favor of a uniformity of action among all trade-mark owners. Particular classes of trade-mark owners have obtained special protection, e. g., manufacturers and vendors of mineral water and other beverages, flour, watches, wines, &c. But these laws only exist in a few States. Marks on watches are protected by an act in Massachusetts; marks

* Prepared for the United States Trade-Mark Association.

on receptacles of wine made from grapes grown in Ohio are similarly protected there. The same may be said of flour marks in Missouri.

In certain States it is made obligatory to mark certain articles, e. g., in New York, by act 1860, every person who shall put up and press hay for market shall put up the initials of his name on some piece of wood attached to the bale of hay, and by act of 1865, every manufacturer of butter firkins is required to brand the same with his name and the true weight of the firkin.

In Ohio it was provided that the weight of soap and candles and the name of the manufacturer must be marked on the box; marks were also obligatory on packages of sugar, rice, tobacco, &c. In New Jersey (1877) trade-marks on packages of commercial manures are obligatory.

In South Carolina many articles are enumerated in the Revised Statutes of 1873, subject to inspection, and to which marks and names must be affixed.

From the facts stated in this article, we are led to the conclusion that the Legislatures of the States are ready to adopt proper legislation in regard to trade-marks, and also that a certain uniformity of laws may be readily obtained. The questions of compulsory marks, and of protection for unfilled marks, will be raised by the same facts. They are reserved for a subsequent article.

COKE ITEMS.

There are rumors that a large number of coke ovens are to be erected along the banks of the Monongahela River, in some of the upper pools. The coal at the location in question has been coked in beehive ovens, and has yielded a firm, bright, hard coke. But few ovens have been erected on this river, and those are in the immediate vicinity of Pittsburgh. Should this project be carried out, and the coke proves what it is claimed to be, it will have an important bearing on the Connellsville coke trade.

It is now a settled fact that the large body of the celebrated coking coal that lies up Dickson Run and beyond is being eagerly sought after, and it will not be long until that portion of Dunbar township will be alive with coke ovens. Different railroad companies are moving with steady tread toward the opening up of this new coal field, which is without doubt the finest in the State that remains undeveloped. The Southwest Pennsylvania Company have their survey made to the banks of the river in this town, and the Lake Erie road are moving up the river on the survey made a year ago. They have had their engineers for some time past taking in this coal field, and they know just what is in store for them.—Connellsville Courier.

Messrs. Stouff & Lomison, Scottsdale, Pa., have 30 coke ovens in full blast, and are finding a ready market for all the coke they can produce.

One hundred coke ovens are in full blast at the works of the Mahoning Coke Company, Dunbar, Fayette County, Pa. All of the product is used at their furnace.

The weekly product of manufactured coke in the Pittsburgh district is about 33,000 tons.

The Wheeling Register thinks Wheeling manufacturers can secure a line to the Connellsville coke region by building a branch of the Baltimore and Ohio Railroad from Fairmount via Morgantown to Uniontown, there to connect with the branch of the Connellsville road. This it thinks a much better and more profitable project than the completion of the Hempfield.

The British Trade Journal says: An American journal recalls the fact that a little over 40 years ago every particle of the table cutlery used in the United States was imported from England. At the present time, out of an annual consumption of \$500,000 worth of these commodities, England supplies not more than 8 per cent., and American cutlery now goes largely to Australia, South America, and even to Europe. In fixing the cause of this rapid growth, our contemporary holds the secret to lie in the extensive substitution of machinery for the hand labor largely depended upon abroad. The cutting of the wood for the handles, the finishing of the ivory, the cutting of the steel, the shaping of the knife, the fastening of the handle, the designing of the ornamentation for the handles, the grinding, the finishing of the blades, and numerous other minutiae are all done by machinery, most of which are also made in the works. Is it that we have lost this trade because in the past we have been too conservative to have recourse to machinery for turning out our work?

A story comes from Nemehah County, Mo., that one David Meisenhahler was killed a few days ago by a meteor or aerolite. He was driving cattle from the field when the meteor descended obliquely through a tall maple, cutting the limb as clean as though it had been a cannon ball. It struck Meisenhahler near the shoulder, passing through his body obliquely, and burying itself two feet in the earth. The meteor is composed of iron pyrites, round and rough, about the size of a common water bucket. We never before heard of an iron pyrites aerolite, but then we cannot undertake to say that there are not plenty of them meandering around through space, waiting for a good chance to kill cattle-drivers.

A cable dispatch from London says that the corporation of Dunfermline, Scotland, is at a deadlock on the question of accepting a gift of £5000 pounds from Mr. Andrew Carnegie, of Pittsburgh, a native of Dunfermline, for the establishment of a free library and reading rooms, the Provost having declined to cast the deciding vote in the absence of information whether the donor intends to provide for the maintenance of the library.

An explosion of fire damp occurred in the Paintertown mines of the Pennsylvania Gas Coal Company, near Irwin's Station, on the Pennsylvania Railroad, on the 29th ult., which resulted in the death of two men, and the probable fatal injury of another. The cause of the explosion is unknown. The mines have heretofore been considered perfectly safe.

American Trade with Germany.—The United States consul at Sonneberg, Germany, in a dispatch to the Department of State, transmits his annual report of the trade of his consular district. The stagnation of the past seems to be broken only by an increase of exports to the United States. The effects of the new German tariff are yet problematical; so far as investigation goes, a reaction against it seems to be prevailing. American manufactures and machinery are an important factor in all discussions and calculations in political economy. Notwithstanding the competition of American manufactures, it is stated that 400,000 sewing machines were made in Germany last year. The annual production of cotton hosiery in Saxony alone is estimated in value at over \$10,000,000. In this article also the progress of machinery in the United States has marked a revolution. In Sonneberg and vicinity the toy trade is almost remarkable. The number of marbles produced in the district annually exceeds 100,000,000, besides a large amount of crude material shipped to France, where marbles are sold cheaper than in Germany. Of slate pencils 250,000,000 are made, large quantities being sent to America. Some idea of the trade in toys may be gained by a statement that in Sonneberg 100 persons are constantly engaged in making packing boxes for toys for exportation. German toys are made chiefly of wood and papier maché. America has entered into competition by making many toys of tin.

Is Chlorine an Element?—Prof. Victor Meyer, in a letter addressed to Dr. H. Endemann, states that the communications in the English journals concerning his investigations, which report the separation of oxygen from chlorine, have been published without his knowledge and against his wishes, and that they are entirely incorrect in essential particulars.

A newspaper correspondent visiting the barb fence wire works at Johnstown, Pa., was told that they produced 20 miles of barb wire per day, and solicited as follows: Twenty miles! What a panorama! Twenty miles of weeping boys on one side of a fence and tempting orchards on the other. Twenty miles of astonished cattle madly waltzing up the hill or down the road sideways, or twisting their tails in unendurable anguish and walking around on their hands. Every day 20 miles of fence, upon the top rail of which no man can sit and talk politics with his neighbor—not with any degree of comfort. If this kind of fence keeps on, the rights of citizens to 'meet and discuss,' guaranteed by the Constitution, is going to be seriously abridged in the rural districts.

Special Notices.

ELIZABETHPORT ROLLING MILL,
Elizabethport, N. J.,

**Common and Refined
BAR IRON,
Fish Plates, Spikes, &c.**

DANIEL W. RICHARDS & CO.,
Importers of and Dealers in Scrap Iron and Metals,
88 to 96 Mangin St., New York.

**Foundry and Machine Works
For Sale,
TO CLOSE CO-PARTNERSHIP.**
Located in Columbia, Lancaster County,
Pa., on a Main Street.

Ground 200 ft. front, 100 ft. deep. Machine Shop, 60x40, with Pattern Shop in second story; Smith Shop, 25x35, with Boiler House adjoining; Foundry, 25x35, with 2 cranes and 2 spot Brass Furnaces. All brick buildings with slate roofs, and rebuilt 1872. Also, frame Pattern Warehouse, slate roof. Patterns, Tools and Fixtures for Blast Furnace, Rolling Mill and general heavy work. Works are near several railroad depots, with siding alongside, and are doing a good business. Will sell out entire works, or sell ground and buildings with the steam power for other purposes.
PERROTTET & HOYT, Proprietors.

Price Books.

Full Leather, \$7.50. Half Leather, \$6.50.
Pocket Edition, Full Leather, \$3.50.
DISCOUNT. Bolt List, \$1.50.
Leigh's Discount Book, 50 cents.
Buell Lamberson, 97 Chambers St., N. Y.

**JOHN E. SWAN & BROTHERS,
IRON MERCHANTS,**
Glasgow and Middlesbrough,
Exporters of all brands of

Scotch & English Pig Iron.
and
c. f. i. to America or f. o. b. British ports.

**Old Iron Rails, Puddled Bars
AND MANUFACTURED IRON.**

**For Sale or Lease.
FOUNDRY,
NEW YORK CITY.**

The plot of ground (Emmelor Works) measures 275 ft. frontage by 100 feet deep. It has a splendid Foundry, 60x165 feet, with cupolas, cranes, &c. If leased, additional buildings to any extent will be erected to accommodate any kind of manufacturing business. Apply to WM. J. FRYER, Jr.,
Atlas Iron Works, 104 Goerck Street.

Sanderson Bros. Steel Co.
A limited number of shares for sale by
EDWARD FRITH & SON,
241 Pearl Street, New York.

Special Notices.

FOR SALE.

**THE VALUABLE
ROLLING MILL PROPERTY
KNOWN AS THE
FORT ALLEN IRON WORKS,
At Weissport, Carbon Co., Pa.,**

On the line of the Lehigh & Susquehanna Railroad, and Lehigh Canal, four miles east from Mauch Chunk, in the Coal and Iron district, and having good access to the New York and Philadelphia markets. This property consists of one puddle mill and three puddling furnaces; one large merchant mill with heating furnace to feed it; one small merchant mill with heating furnace; new engine and belt, and all the necessary machinery, in good repair, to run both mills. All the necessary tools for running the mills will be sold with the property. It can therefore be started with very small expense. For sale on favorable terms. Apply to

**MARSHALL BROS. & CO.,
Front St. and Girard Ave., Phila.**

**For Sale,
THE ROUGH AND READY HOT BLAST
CHARCOAL FURNACE**

situated in one of the healthiest regions of Tennessee, with all its modern improvements, including a 30-horse-power engine, and two 40-foot boilers. The furnace is in close proximity to inexhaustible supplies of rich brown hematite ore and limestone, and the rail and river shipping facilities are excellent. Iron can be manufactured for not exceeding \$15.00 per ton, and put into market within 24 hours. Furnace can be put into blast without much expense for repairs. Included in the property are 6000 acres of fine timber land, including 1500 acres which are improved and under cultivation; a Saw and Grist mill with 12 horse-power engine; fuel boiler, Carpenter and Blacksmith shops, Stables and Crib, Coal Engine, Cinder, Casting, Tool, Store and Ware, and about 60 Dwelling Houses. It is the wish of the undersigned to sell only the whole of this property, which can be bought on reasonable and liberal terms. For further particulars

Address
D. THEOBALD, Youngstown, Ohio.
A. GUCKENHEIMER & BRO.,
93 First Avenue, Pittsburg, Pa.

PRIVATE SALE

OF A VALUABLE

Rolling Mill Property.

The undersigned offer at private sale that certain property known as the "Columbia Steel Works," formerly the property of the York County Iron Company, situated on the Northern Central Railway and the Frederick Division of the Pennsylvania Railroad, at York, Pa. The tract contains about seven acres of ground, with a stream of water passing the same, and on which is erected a frame iron roll Rolling Mill Building, about 100 x 200 feet.
The Machinery consists in part of the following, to wit:
1 Steam Engine, 15 H. P., with two pairs of Shears.
1 Steam Engine, about 40 H. P., with two Blowing Cylinders.
1 Steam Engine, about 150 H. P., with Duplicate Cylinder.
15 Boilers and Heating Furnaces.
1 Train Roller for Merchant Iron.
1 Train Roller for Pig Iron.
1 Train Round Iron. Several Trains for T-Rails.
1 Crusher, Punch, Saw, Tools, &c.
The above property will be sold at a bargain. For further information apply to the

**FARMERS' FIRE INSURANCE CO.,
York, Pennsylvania.**

**AN EXPERIENCED HARDWARE
man, fifteen years in charge of house in this city. Was bookkeeper, cashier, stock buyer, salesman and one of the managers. Open for any position at a moderate and reasonable salary. First-class city references. Address
HARDWARE, Station L, New York City.**

FOR SALE.

Boiler 150-horse-power, engine 200-horse-power, and other smaller sizes. Machinery for rolling steel tires complete. Machinery for making iron with the greatest economy. All sizes built at short notice. Boilers built to order warranted the most economical.
Apply or address
LESLIE, Manufacturer,
Railroad Avenue, Jersey City.

DESIGNS

**Superior Manufacturers' Tools
And Special Appliances.**
Improvements made, ideas worked out. Drawings, models, patterns and machines made in the best manner.

RICHARDS & DOLE, Springfield, Mass.

CALIFORNIA AGENCY.
A San Francisco firm of File and Tool makers having an agent constantly traveling among the consumers in the State and West Coast, is desirous of representing some first-class Eastern Houses in the manufacturing hardware trade.
Address **AGENCY, 348 Beale St.,
San Francisco, Cal.**

FOR SALE,
Job Lots and Bankrupt Stocks Hardware.
Great bargains offered to the trade.

**A. W. WHEELER,
141 Lake St., Chicago.**

**Bissell & Welles,
Wholesale Hardware Auctioneers,
83 Chambers and 65 Beale Sts., N. Y.**

Sales held weekly for the trade. Consignments solicited. We refer to the leading Manufacturers and Importers.

**Wanted to Purchase,
AN
Iron Ore Mill, with Revolving Table.**

Send description and price to
S. B. LOWE,
Chattanooga, Tenn.

**ASTONISHING POWER
IN
PUNCHING & SHEARING PRESSES.**

See our illustrated advertisement on next to last page of this paper.
PEERLESS PUNCH AND SHEAR CO.,
52 Dey Street, New York City.

Special Notices.

**SECOND-HAND
and NEW TOOLS
FOR SALE LOW.**

January List No. 1.

Miscellaneous Second-Hand Tools.

All in Good Order, and will be sold very low

Two Engine Lathes, 20 in. swing x 7 1/2 ft. bed.
Two Engine Lathes, 20 in. swing x 8 ft. bed.
One Engine Lathe, 24 in. swing x 12 ft. bed.
One Engine Lathe, 18 in. swing x 12 ft. bed.
One Engine Lathe, 18 in. swing x 14 ft. bed.
One Engine Lathe, 18 in. swing x 8 ft. bed.
One Engine Lathe, 18 in. swing x 6 ft. bed.
One Engine Lathe, 12 in. swing x 5 1/2 ft. bed.
Seven Engine Lathes, 18 in. swing x 7 1/2 ft. bed.
(Chain-feed Lathes.)
One Horizontal Boring Lathe.
Six Turning Lathes, 14 in. swing x 4 1/2 ft. bed.
Two Wood-Turning Lathes.
One Bement Double-Pulley Lathe.
One Planer, 24 in. x 5 ft.
One Planer, 30 in. x 7 ft. chuck, &c.
One Planer, 30 in. x 7 ft. x 10 ft.
One Planer, 72 in. x 26 in. x 24 ft.
Two Planers, 18 in. x 5 ft.
One Planer, 24 in. x 5 ft.
One 24 in. Frame Drill.
One Traverse Drill.
One Four-Spindle Drill.
One Shaping Machine, 12 in. stroke.
Three Bolt Cutters, various sizes.
One No. 2 Bolt Cutter.
One Gear Cutter.
One new "Hardaway" Bolt Heading Machine, to head up to 7/8 in. bolts.
One new "Hardaway" Bolt Heading Machine, to head up to 1 1/4 in. bolts.
A lot of Saw Tables and Wood Working Machinery.

NEW TOOLS, Very Low.

One Shaping Machine, 14 in. stroke, Wood & Light.
Five No. 2 Bolt Cutters, Wood & Light.
One No. 1 Bolt Cutter, with center, Wood & Light.
Three No. 2 Bolt Cutters, with center, Wood & Light.
One Planer, 30 in. x 8 ft. New Haven.
One Upright Drill, 38 in. New Haven.
Please specify which of the above tools you want and we will forward all particulars.

**A Woodruff & Beach
Beam Engine,**

Low pressure, 42-inch cylinder, 84 inch stroke, with fly-wheel pulley 30 feet diameter, 36 inch face, and

Four Tubular Boilers,
60 inches in diameter, 20 feet long, and all connections practically as good as new.
For sale by

**The Geo. Place Machinery Agency,
121 Chambers and 103 Beale St.,
NEW YORK.**

A. J. STEINMAN, Chairman. W. B. MIDDLETON, Supt.
W. G. MENDENHALL, Sec'y & Treas.

**OFFICE OF
PENN IRON COMPANY, Limited,**

MANUFACTURERS OF
**Merchant Bar Iron, Hammered and
Rolled Axes, Car Forgings, Bridge
Work, Fish Joints, Bolts, R. R.
Spikes, Bolt Ends, &c., &c.,
LANCASTER, PA.**

WANTED.
A good second-hand engine, 16 or 17 inch diameter cylinder, short stroke, to run about 200 revolutions per minute; suitable to drive a train of small rolls.

FOR SALE.
One large Planer, 25 ft. long, 5 ft. square, built very heavy, in first class condition. Also, one Boring Mill, one large Slotter, one Shaper, three Drill Presses, one small Lathe, lot of Vises, one Steam Hammer for making blooms, lot of Wood-Working Machinery for making patterns, Shafting and Pulleys; also, large lot of Flasks and Foundry Fittings, for doing light and heavy work, and one large Cupola and one large Foundry Crane, all in good condition and for sale cheap.
PENN IRON CO., LIMITED,
Lancaster, Penn.

FOR SALE.
Thorne & DeHaven Portable Drill.
Bement Car Wheel Borer, 48-inch.
36-inch Radial Drill, A. B. & Co.
36 in. x 36 in. x 10 ft. 6 in. Bement Planer.
36 in. x 10 ft. Chuck Lathe, N. Y. Steam Engine Co.
Pair Planer Centers. Centering Machine.
Kino and Quip Pumps. Mine Hoist.
Wood Working Machinery, all kinds.
A. G. BROOKS & WINEBRENER,
261 N. Third Street, Philadelphia.

For Sale.
23 in. x 48 in. CORLISS ENGINE.
Can be seen running. Will be delivered latter part of this month. Also 18 in. x 42 in. Hewes & Phillips. Can be delivered at once.
E. P. BULLARD,
14 Dey St., New York.

BUSINESS OPPORTUNITY
A responsible Hardware house, well established in a healthy and prosperous Western city (not Chicago or St. Louis) want additional cash capital to extend a rapidly increasing trade. Long experience enables present partners to personally manage the business. An excellent opportunity to enter an established concern. Business has always been profitable. First-class references given and required. Only parties having ample ready means address
O. C. APPLETON,
Care P. O. Box 672, New York, N. Y.

TRUSTEES' SALE OF VALUABLE IRON PROPERTY.
Two New Charcoal Blast Furnaces, Forty-Four Thousand Acres of Valuable Land—Pursuant to a mortgage executed by James Woods, H. C. Yeatman and James Woods, Jr., registered in the Register's Office of Stewart Co., Tennessee, in Book 24, pages 419 to 430, inclusive, the undersigned will sell on the premises, for cash, on the 31st day of March, 1880, that very valuable iron property located in Stewart County, Tennessee, known as Cumberland Iron Works. Parties wishing full information will please address the undersigned, care of Third National Bank, Nashville, Tenn.

**TEMPLE O. HARRIS, Trustees.
V. L. KIRKMAN.**

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E. P. BULLARD,
14 Dey St., New York.

Special Notices.

FOR SALE OR LEASE.

The Extensive Engineering Establish-

ment known as

**THE SOUTHWARK
FOUNDRY,
PHILADELPHIA.**

This property occupies the entire square bounded by Washington Avenue, Federal Street, Fourth and Fifth Streets, and covers about 35 acres. A track runs entirely through the works, connecting with railway system of the country, by which raw material can be supplied to the various departments, and finished machinery loaded on cars by means of a power crane lifting thirty tons. The improvements are: Pattern Shop, nearly fire-proof, two stories. 24x40

In the lower story of which are five pattern storage rooms, entirely fire-proof, each... 24x40
Foundry... 30x100
Brass Foundry... 50x24
Smith Shop, one story... 100x40
Erecting Shop... 100x40
The Erecting Shop has an intermediate Gallery Floor at one end... 27x64
do do at other end... 32x64
Office, with fire-proof vault, two stories... 24x40
Machine Shop, three stories... 50x24
Smith Shop, one story... 100x40
Boller Shop, one story... 100x40
With Intermediate Gallery Floors at each end for weighing a loaded car... 35x49
Boller House, with bins for coal and storage... 26x35
Platform Scales, between office and machine shop, and between machine and boller shops... 26x35
Track Scale, between boller and pattern shops, capable of weighing a loaded car... 26x35
The second story of the office is one room for the drawing department, connecting with the Superintendent's office, and will accommodate twelve to fifteen draughtsmen.

All of the above are brick; the office, boller shop and pattern shop fronts on Washington Avenue being of pressed brick and harmonious in design.

The shops are supplied with all the tools requisite to carry on a business amounting to over a million dollars per annum, and to employ advantageously from 700 to 800 men.

Machinery all driven by power, as follows: Boller located in boller house, about the center of the property; a heavy horizontal engine, 200 horse power, and a lathe driven by a horizontal engine. Foundry has extensive core-ovens, overhead railway crane, driven by its own engine and boiler; one steam crane, one power crane, driven by pug-mill engine; a pair of vertical blowing engines, hydraulic lift for coal and iron; two large cupolas, and all requisite fixtures. Brass foundry has four pot furnaces and a small cupola. Erecting shop has in it two large planing machines, one of them a pit machine, which takes a piece of work 8 feet wide, 20 feet long and 20 feet high, and in which the tool travels. The other is a heavy table planer 22x22x20, in which the work travels. Two power cranes, lifting 30 tons each, command the floor, and a power crane commands the track, for loading heavy work and a large lathe, 7 feet swing and 25 feet bed, all driven by an oscillating engine in the machine shop, all the tools are of improved construction, driven by two lines of shafting on each floor, all operated by a large horizontal engine, driving them, through belts, in such a manner as will allow each line to be thrown out without interfering with the others.

The lower floor is commanded by cranes through its whole length, communicating with the second floor, on which are small lathes and planers, and the third, on which are storage rooms. The boller shop is divided into two parts, one with a hoist to take a cylinder boiler 20 feet long. Punch and shears with carriage on track, set so that the plates can be drilled and sheared without readjustment.

On adjoining lot is a stable 18x64, which will be sold with the property.

For further particulars, price, terms, &c., address

**MERRICK & SONS,
230 South Third St.,
PHILADELPHIA.**

**JOHN R. WHITLEY & CO.,
European Representatives of First-
Class American Houses,**

WITH
**FIRST-CLASS AGENTS
IN THE
Principal Industrial and Agricultural
Cities and Centers of Europe.**

TERMS ON APPLICATION.
**LONDON, PARIS,
7 Foultry, E. C. 8 Place Vendôme.**

**The Sherman Process Co.
9 Pemberton Square, Boston, Mass.,
Issue Licenses to use the Process for the
Manufacture of Iron and Steel**

In the Bessemer Converter, Crucible, Siemens, Martin, Puddling, Blast and Cupola Furnaces.

The use of this Process improves the quality of the product, saves fuel and labor, and does not require any change in furnace or manner of working. See page 17 of The Iron Age of Oct. 15th, 1877.

**WE QUOTE FOR
STEEL OR IRON RAILS, STEEL TIRES,
Axes, Forgings, Bars, Plates, Angles, Sheets and
Billets of any temper or for any purpose. Also
Steel Nail Sheets, Wire Rods, Springs, and all
kinds of Steel goods. Also, Spiegeleisen, Ferro-
manganese and Silicious Pig Iron, f. o. b. any
British port, or c. f. i. any United States port.
Thirty years' experience in the Steel Trade.**

**NIXON BROTHERS,
Newcastle-on-Tyne, ENGLAND.**

To Skate Manufacturers.
The patent right of a new and superior Roller Skate will be sold or leased to well-established parties.

J. H. BOWEN,
339 Walnut St., Philadelphia.

For Sale.
Stock of hardware, stoves and implements, and store furniture, in one of the best towns in Kansas.

Address **HARDWARE,
Box 366, Salina, Kansas.**

Special Notices.

For Sale.

One 18-in. Muck Train, 3-high.

One Breaking-down Train, 3-high.

One Engine, 14x30.

One " 9x30.

One Rail Punch and Straightener.

Two Rail Saws and connections, all in good order, having been in use only a short time. For terms

&c., address,

**J. M. BROWNSON,
P. O. Box 748, Pittsburgh, Pa.**

To Manufacturers.

We are prepared to furnish

**Recipes and Information
ON ALL
INDUSTRIAL PROCESSES.**

Address
**PARK BENJAMIN'S SCIENTIFIC
EXPERT OFFICE,
37 Park Row, - NEW YORK CITY.**

**LEIGH'S
Discount Book.**

Specially arranged for the Hardware and other trades using Combination Discounts. Mailed postpaid on receipt of price.

Bound in Leather, Silicate Leaves... \$1.00
Cloth... 50

Address
**EDWARD B. LEIGH,
St. Louis Elevator, St. Louis, Mo.**

Or either of the Publishers, viz:
IVISON, BLAKEMAN, TAYLOR & CO., New York.
R. & T. A. ENNIS, St. Louis.

**Asbestos and Chromate of Iron,
Iron Ores and Manganese.**

The undersigned are prepared to negotiate for Specular and Magnetic Iron Ores, also Manganiferous Iron Ores and Manganese from Virginia and other Southern States.

**CHAS. L. OUDESLOUX & SON,
67 Exchange Place, Baltimore.**

**SITUATION WANTED.—As Superintendent of
Rolling Mill for making Bar Iron. Can give good reference as to character, ability, &c. Salary \$1800. Address SUPERINTENDENT,
Office of The Iron Age, 53 Beale St., New York.**

FOR SALE.—175 doz. 2-time Hay Forks, plain, 5 and 6 ft. handles; 75 doz. 3-time Hay Forks, plain, 6 ft. handle; 25 doz. L. & D. H. Manure Forks; 200 doz. C. B. Garden Rakes, mostly 14 teeth; 15 doz. U. S. Garden Weeders, 4 prongs. All first quality goods, and will be sold very low to close the lot. Address "Manufacturer," Office of The Iron Age, 53 Beale St., New York.

TO MANUFACTURERS AND CAPITALISTS.

**FLOWER PINS.
PATENT FOR SALE.**

Address
**J. H. PLUMMER,
1276 Pacific Street, Brooklyn, N. Y.**

**WANTED.—By a man of long and practical experience in the manufacture of Iron Blast Furnaces and Rolling Mills, a situation as Superintendent. Address "H,"
Office of The Iron Age, 53 Beale St., New York.**

**WANTED.—A situation in the Hardware business. Have had seven years' experience. References furnished. Address
P. O. Box No. 190, Hartford, Conn.**

Special Notices.

MENGIS & CO.,

BANKERS

AND

Railway Commission Merchants.

Dealers in all kinds of

Scrap, Wrought and Pig Iron,
Old Rails and Car Wheels,NEW STEEL AND IRON RAILS A
SPECIALTY.

We have established the above house for the purpose of doing a general Railway Commission business. We negotiate the sale of Railroads (or the controlling interests), and effect consolidations and reorganizations.

We also import direct from different European ports all grades of Iron, Pig, Bessemer Steel, Old Rails, &c.

We sell Locomotives, Passenger, Flat and Box Cars at manufacturers' prices.

Any business in our line we respectfully solicit a share of, always endeavoring to promote the interests of our customers. All orders, either by telegraph or mail, promptly attended to.

Mengis & Co.,

43 Pine St.,

NEW YORK.

Post Office Box 154.

Notice to Manufacturers.

The advertiser desires to open communications with a manufacturer who has facilities beyond his own business, and can make an article akin to hardware in which there is money.

Address "C,"

Office of The Iron Age, 83 Reade Street, N. Y.

A SWEDISH ENGINEER of many years' experience in the manufacture of iron and steel, for several years manager of the furnace at the largest Martin-Siemens works in Sweden, and skilled in all pertaining to the construction and management of rolling mills, gas producers for sawdust and gas-welding furnaces, desires a position from next Spring. Speaks also English and German.

Address K. 33,

Filipstad, Sweden, poste restante.

FOR SALE.

The entire Canadian right of Kenyon's Adjustable Chain Pump Bucket, a superior and substantial article. Can be accurately adjusted to fit the tube, and enlarged to take up the wear, so that the pumps can be kept in good working order. United States County and State rights for sale. Address,

THOMAS KENYON, Patenteo,

Box 103, Hamilton, Ohio, U. S. A.

Wanted.

A gentleman of several years' experience on the road in Hardware specialties, would like to make an engagement with some house or manufacturer to travel, or would take a line in addition to the one now handled. Can furnish first class references, both present employers and others.

Address Box 48,

Office of The Iron Age, 83 Reade St., New York.

Notice to Hardware Manufacturers

Having served 12 years as representative of one of the principal manufacturers dealing directly with the largest Hardware firms in the United States, with whom I have personally acquired, I am prepared to negotiate with some first-class manufacturer of repute to market entire production. References as to ability, &c., guaranteed.

Address "METAL,"

Office of The Iron Age, 83 Reade St., N. Y.

Wanted.

First class Bar Mill Roller.

First class Bar Mill Heater.

It will be useless for any but first class workmen and entirely sober men to apply. References required. Address BAR IRON,

Office of The Iron Age, 83 Reade St., New York.

For Sale.

The Stevens Iron Furnace, located at Drakesville Station, N. J., on the Del. Lackawanna & Western R. R. Easy of access; in good location for coal and iron ore. Will be sold at a reasonable price and easy payments to a good party. For further particulars, address

GEO. H. MOLLER, Sec'y,

24 Nassau St., New York.

TWENTY YEARS' EXPERIENCE in the Hardware, Store and Plumbing business, associated with his father, besides an apprenticeship from boyhood. Has acted as bookkeeper, financier, stock buyer, salesman and manager, working often eight to ten men. Open for any position, at a moderate salary, after Jan. 1st. Good reasons for seeking a change. First-class references.

Address

Box 537 New York City.

Trade Report.

Office of THE IRON AGE,

TUESDAY EVENING, December 30, 1879.

As the occurrence of a general holiday causes us to go to press this week a day earlier than usual, we are obliged to omit some of our customary tables, which could not be obtained in time to go into this issue. The closing week of the year has been uneventful in financial circles, and the markets have been quiet and steady.

In the local money market the ruling rate for call loans has been 7%, with loans as low as 4%.

Government bonds are strong, and prices have remained quite steady. The closing quotations will be found below.

The stock market has been somewhat irregular and generally strong. At the close, however, the market is weak. We give below the closing quotations of active shares.

The bank return shows a decrease of \$1,644,300 in surplus reserve, which now stands at \$212,350, against \$10,478,775 at this time last year, and \$7,991,950 at the corresponding period in 1877. The loans show a loss this week of \$513,900; the specie is down \$2,204,700; the legal tenders are decreased \$453,700; the deposits other than United States are down \$4,056,400, and the circulation is increased \$81,100.

The following is an analysis of the bank totals of this week compared with that of last week:

	Dec. 20.	Dec. 27.	Comparisons.
Loans.....	\$278,098,100	\$277,384,200	Dec. \$713,900
Specie.....	50,845,900	48,638,200	Dec. 2,204,700
Legal tenders.....	12,543,400	12,089,700	Dec. 453,700
Tot. reserve.....	63,387,300	60,727,100	Dec. 2,660,200
Deposits.....	246,118,000	242,062,200	Dec. 4,055,800
Reserve required.....	61,590,650	60,515,550	Dec. 1,075,100
Surplus.....	2,256,650	212,350	Dec. 2,044,300
Circulation.....	23,651,900	23,733,000	Inc. 81,100

The foreign trade movements at the port of New York since our last issue are shown in the following tables:

Imports.

For the week ended December 27:

	1877.	1878.	1879.
--	-------	-------	-------

Dry goods.....	\$773,073	\$903,923	\$1,262,913
General mds.....	3,678,660	4,600,423	7,327,917

Total for week.....	\$4,451,733	\$5,504,346	\$8,590,830
Prev. reported.....	31,744,597	28,315,788	33,401,862

Since Jan. 1.....\$316,196,650 \$286,880,744 \$240,997,692

Included in the imports were items of merchandise valued as follows:

	Quantity.	Value.
--	-----------	--------

Anvils.....	76	\$337
Brass goods.....	10	823
Bronzes.....	8	769
Chains and anchors.....	1	344
Copper.....	137,002	18,693
Cutlery.....	62	28,640
Guns.....	22	5,204
Hardware.....	7	429
Iron, hoop, &c.....	7	18,693
Iron, pig, tons.....	3,509	50,406
Iron sheet, tons.....	404	16,840
Railroad bars.....	3,010	19,386
Iron ore, tons.....	1,137	18,693
Iron, other, tons.....	2,554	84,814
Lead, pigs.....	10,847	10,847
Metal goods.....	1	1,730
Needles.....	5,879	5,879
Old metal.....	16,120	16,120
Platina.....	4,093	4,093
Plated ware.....	4	319
Saddlery.....	1	810
Steel.....	1,928	23,580
Spelter.....	63,371	58,685
Silverware.....	9	1,570
Tin, bbs.....	179	8,613
Tin, bbls.....	3	463
Tin, 256 slabs.....	22,084	4,530
Wire.....	275	3,573
Zinc.....	166,464	8,672

Exports of specie.

For the week ended December 27:

Total for the week.....	\$61,915
Previously reported.....	14,495,927
Total since Jan. 1, 1879.....	\$14,657,842

Government bonds at the close were firm at the following quotations:

	Bid.	Asked.
--	------	--------

U. S. 6's 1880 registered.....	102 1/2	103 1/2
U. S. 6's 1880 coupon.....	102 1/2	103 1/2
U. S. 6's 1881 registered.....	102 1/2	103 1/2
U. S. 6's 1881 coupon.....	102 1/2	103 1/2
U. S. 6's 1882 registered.....	102 1/2	103 1/2
U. S. 6's 1882 coupon.....	102 1/2	103 1/2
U. S. 6's 1883 registered.....	102 1/2	103 1/2
U. S. 6's 1883 coupon.....	102 1/2	103 1/2
U. S. 4's 1877 registered.....	102 1/2	103 1/2
U. S. 4's 1877 coupon.....	102 1/2	103 1/2
U. S. 4's 1878 registered.....	102 1/2	103 1/2
U. S. 4's 1878 coupon.....	102 1/2	103 1/2
U. S. 4's 1879 registered.....	102 1/2	103 1/2
U. S. 4's 1879 coupon.....	102 1/2	103 1/2
U. S. 4's 1880 registered.....	102 1/2	103 1/2
U. S. 4's 1880 coupon.....	102 1/2	103 1/2
U. S. 4's 1881 registered.....	102 1/2	103 1/2
U. S. 4's 1881 coupon.....	102 1/2	103 1/2
U. S. 4's 1882 registered.....	102 1/2	103 1/2
U. S. 4's 1882 coupon.....	102 1/2	103 1/2
U. S. 4's 1883 registered.....	102 1/2	103 1/2
U. S. 4's 1883 coupon.....	102 1/2	103 1/2
U. S. 4's 1884 registered.....	102 1/2	103 1/2
U. S. 4's 1884 coupon.....	102 1/2	103 1/2
U. S. 4's 1885 registered.....	102 1/2	103 1/2
U. S. 4's 1885 coupon.....	102 1/2	103 1/2
U. S. 4's 1886 registered.....	102 1/2	103 1/2
U. S. 4's 1886 coupon.....	102 1/2	103 1/2
U. S. 4's 1887 registered.....	102 1/2	103 1/2
U. S. 4's 1887 coupon.....	102 1/2	103 1/2
U. S. 4's 1888 registered.....	102 1/2	103 1/2
U. S. 4's 1888 coupon.....	102 1/2	103 1/2
U. S. 4's 1889 registered.....	102 1/2	103 1/2
U. S. 4's 1889 coupon.....	102 1/2	103 1/2
U. S. 4's 1890 registered.....	102 1/2	103 1/2
U. S. 4's 1890 coupon.....	102 1/2	103 1/2
U. S. 4's 1891 registered.....	102 1/2	103 1/2
U. S. 4's 1891 coupon.....	102 1/2	103 1/2
U. S. 4's 1892 registered.....	102 1/2	103 1/2
U. S. 4's 1892 coupon.....	102 1/2	103 1/2
U. S. 4's 1893 registered.....	102 1/2	103 1/2
U. S. 4's 1893 coupon.....	102 1/2	103 1/2
U. S. 4's 1894 registered.....	102 1/2	103 1/2
U. S. 4's 1894 coupon.....	102 1/2	103 1/2
U. S. 4's 1895 registered.....	102 1/2	103 1/2
U. S. 4's 1895 coupon.....	102 1/2	103 1/2
U. S. 4's 1896 registered.....	102 1/2	103 1/2
U. S. 4's 1896 coupon.....	102 1/2	103 1/2
U. S. 4's 1897 registered.....	102 1/2	103 1/2
U. S. 4's 1897 coupon.....	102 1/2	103 1/2
U. S. 4's 1898 registered.....	102 1/2	103 1/2
U. S. 4's 1898 coupon.....	102 1/2	103 1/2
U. S. 4's 1899 registered.....	102 1/2	103 1/2
U. S. 4's 1899 coupon.....	102 1/2	103 1/2
U. S. 4's 1900 registered.....	102 1/2	103 1/2
U. S. 4's 1900 coupon.....	102 1/2	103 1/2

The following were the closing quotations

of active shares:

	Bid.	Asked.
--	------	--------

Alton and Terre Haute.....	18	18
American District Telegraph.....	74	74
Atlantic and Pacific Telegraph.....	74	74
Boston Water Power.....	11 1/2	11 1/2
Burlington and Quincy.....	127 1/2	127 1/2
Canada Southern.....	66 1/2	66 1/2
Cent. Arizona.....	60	60
Canton.....	50	50
Caribou.....	5 1/2	5 1/2
Col. Chicago and Indiana Central.....	20 1/2	20 1/2
Clev. Col. Cin. and Indianapolis.....	7 1/2	7 1/2
Chicago, St. Paul and Minn.....	46 1/2	46 1/2
Chicago and Alton.....	90	90
Chesapeake and Ohio.....	18 1/2	18 1/2
Delaware, Lack. and Western.....	8 1/2	8 1/2
Delaware and Hudson Canal.....	7 1/2	7 1/2
Express-Adams.....	73 1/2	73 1/2
Express-American.....	57 1/2	57 1/2
United States.....	48 1/2	48 1/2
Wells, Fargo & Co.....	104 1/2	104 1/2
Excelsior Mining.....	65 1/2	65 1/2
Hammond and St. Joseph.....	15 1/2	15 1/2
Homestead.....	38 1/2	38 1/2
Illinois Central.....	98 1/2	98 1/2
Ind. Cincinnati and Lafayette.....	4 1/2	4 1/2
Kansas Pacific.....	38 1/2	38 1/2
Kansas and Texas.....	31 1/2	31 1/2
Keokuk and Des Moines.....	14 1/2	14 1/2
Lake Shore.....	99 1/2	99 1/2
Little Pittsburgh.....	86 1/2	86 1/2
Louisville and Nashville.....	120 1/2	120 1/2
Metropolitan Elevated.....	82 1/2	82 1/2
Michigan Central.....	82 1/2	82 1/2
Morris and Essex.....	20 1/2	20 1/2
Mobile and Ohio.....	30 1/2	30 1/2
Manhattan Railway.....	53 1/2	53 1/2
Nashville and Chattanooga.....	30 1/2	30 1/2
New York Central.....	129 1/2	129 1/2

New York Elevated.....	124	125 1/2
New Jersey Central.....	78 1/2	78 1/2
New Central Coal.....	34	34 1/2
Northwestern.....	82 1/2	82 1/2
Northern Pacific.....	31 1/2	31 1/2
Ohio and Mississippi.....	56 1/2	56 1/2
Ontario Silver.....	28 1/2	28 1/2
Pacific Mail.....	38 1/2	38 1/2
Panama.....	166	170
Quicksilver.....	20 1/2	20 1/2
Reading.....	70 1/2	70 1/2
Rock Island and Pacific.....	149 1/2	149 1/2
St. Louis and Iron Mountain.....	47 1/2	47 1/2
St. Louis and San Francisco.....	47 1/2	47 1/2
Standard.....	42 1/2	42 1/2
Union Pacific.....	27 1/2	27 1/2
Wabash and Pacific.....	42 1/2	42 1/2
Western Union Telegraph.....	101 1/2	101 1/2

GENERAL HARDWARE.

In sympathy with the upward tendency of the Iron market, the prices of Hardware have again become unsettled, and the market may fairly be said to be in a feverish condition.

Among the important changes in Hardware values announced during the week is a further advance in the price of Locks, Knobs, Escutcheons, Keys, &c., to discount 45 per cent. by the following manufacturers:

RUSSELL & ERWIN MFG. CO.,
MALLORY, WHEELER & CO.,
P. & F. CORBIN,
READING HARDWARE CO.,
BRADFORD LOCK WORKS,
TRENTON LOCK CO.,
NASHUA LOCK CO.,
PARKER & WHIPPLE,
NORWALK LOCK CO.,
JACOBUS & NIMICK MFG. CO.

This price went into effect on Monday, 29th inst.

The following notice explains itself:
Office of HORACE DURRIE & CO.,
97 Chambers and 81 Reade Streets,
New York, Dec. 30, 1879.

The copartnership heretofore existing between the undersigned, under the firm name of Horace Durrie & Co., will be continued from and after January 1, 1880, by same partners, under the style and firm name of Durrie & McCarty.

As will be seen by the circular which we print below, the works of Rick Brothers, manufacturers of Builders' Hardware, at Reading Pa., were partially destroyed by fire on the 23d instant. Their friends will be pleased to learn that they expect to be in running order early in January. In a letter under date of 24th instant, they state their ability and determination to hold the position they have attained in the market, and add that financially they are as strong as ever.

The following is the circular referred to:

READING, PA., December 23, 1879.
GENTLEMEN: We regret to say that our works were partially destroyed by fire this a. m. We expect to be in running order within two weeks from date, and ask your indulgence for delay in shipping unfilled orders. Please note and oblige.

Truly yours, RICK BROTHERS.

The Atlantic States Nail Association held a meeting in this city to-day, at which the card rate was advanced to \$4.35 for rod. to 60d. This price is net for small lots, but for orders of 200 kegs and over a rebate of 10 cents per keg is allowed. The new card is as follows:

December 30, 1879.

NAILS.

Common, Fence and Sheathing.

	Per keg.	Per keg.	Per keg.
--	----------	----------	----------

rod. to 60d.....	\$4.35	4d. and 5d.....	\$5.10
8d. and 10d.....	4.60	3d. Slatting.....	5.85
6d. and 7d.....	4.85	3d. fine.....	6.60

Coopers' Slatting, Tobacco, Warehouse and Edge

Gripe Fence.

	Per keg.	Per keg.	Per keg.
--	----------	----------	----------

rod. and larger.....	\$4.85	4d. and 5d.....	\$5.60
8d. and 10d.....	5.10	3d. Slatting.....	6.35
6d. and 7d.....	5.35	3d. fine.....	7.10

Spikes of all sizes.....\$4.60

abin Beams, New, reduced list.....	40
abinet or Quilt Frame Clamps, New.....	60
riage Makers' Clamps.....	60
inet or Quilt Frame Clamps.....	60
ing Ladies.....	45
ditional Pictures.....	30
" " Nos. 20 & 23.....	50
" " Patent.....	50
t Extension.....	50
b Bobs.....	50
Wheel.....	50
Wheel Hooks.....	50
e Combs.....	60
ucky Cow Bells, new list.....	40
1 2 3 4 5 6 7	
9.40 8.50 8.75 6.00 5.00 4.70 4.00	
ern Cow Bells, new list.....	40
1 2 3 4 5 6 7 8	
8.60 8.00 7.00 6.00 5.40 4.80 4.50 4.00	
Bells.....	40
p Bells.....	40
ails.....	30
n on End Irons.....	40
ox Pins.....	45
Rings, add new size, No. 30, Copper; 2 per dozen.....	60
s Leaders (List of No. 52, \$3.12).....	50
T Hitting Chains.....	40
arn Harness Snaps.....	55
it.....	50
age Knobs.....	40
S Spikes.....	50
Rods.....	40
crews.....	40
ins' Genuine Gates.....	52½
C.'s Gates (Stebbins' Patent).....	55
1 2 3 4 5	
\$7.00 8.00 9.00 10.00 12.00	
ins' Gates, Nos. 11 to 14.....	45
" " Nos. 21 to 34.....	35
ins' Milk Can Gates.....	.net
ins' V-T Gate Gates, No. 477, Screw Shank, long, 7½ inches inside diameter, \$17 in.....	.net
re Stuffers.....	50
head.....	40
Boxes.....	50
ive Tine Boxes.....	50
Boxes.....	50
Files and Hooks.....	50
Clips.....	50
age Hooks.....	50
Bird Cage Hooks.....	50

rd Cage Hooks	60
Ends and Shade Brackets	30
acks	60
Pressers	60
acks	60
es and Awls	60
n Trowels and Forks	50
Stretchers	50
Tack Claws	50
Tampons No.	40

ammers, Nos. 1 to 40 (change list of \$2.10).....	40
ammers (change list of No. 43 to 40).....	40
ands.....	40
ot Stands.....	30
urners (change list of No. 23 to 20).....	50
aggers.....	50
ch Safes.....	60
vels.....	35
over Stands.....	35
ver Stands.....	35
er Dogs.....	45
on Stands.....	45
ron Beds.....	45
ron Stands.....	40
rella Stands.....	35
on Stands.....	35
oons.....	50
of Glass Plates.....	50
Screws.....	50
rovs.....	40
ood Screws.....	40
crew.....	40
asts.....	50
ting Staples.....	60
ick.....	40
Fastenings.....	45
te Casters, low list.....	45
Casters, low list.....	45
late and Socket Casters.....	45
Socket Casters, low list.....	45
Casters.....	45
for Iron Bedsteads.....	45
Casters, low list.....	45
Socket Bed Casters.....	45
ick Casters.....	45

received the following circulars :

Boston, January 1, 1850.

In consequence of the continued advance in the best grades of Swedish Iron, and the Putnam Nails are made, we determined to maintain the superiority of our goods, we are obliged to raise the price. On and after this date the price of the Putnam Nail will be as

10 9 8 7 6 5 4 3

These prices we make a discount of 1% to the trade. Our terms are payable in Boston or New York reserving the privilege of drawing with exchange, for all bills not paid 10 days. Interest from date, at 7% will be charged on all invoices not paid. We deliver our goods at

goods are at risk of purchaser
 ent from Boston. All orders we
 will be with the understanding
 ce to be charged is one current
 delivery. The steady advance in
 market necessitates us to make
 tions subject to change without
 rties offering or selling our Nails
 at our current rates, will forfeit
 or discounts. Yours respectfully,
 PUTNAM NAIL CO.

TO THE TRADE.

PENNSYLVANIA FILE WORKS,
 Street, above Columbus Avenue.
 PHILADELPHIA, January 1, 1880.

EN : In our circular issued one
 e stated that we would not sell
 s perhaps lower than cost price, and, if
 ould not advance. Our patrons
 of us keeping our word, as we up to
 e have not advanced. But on
 e decided advance in materials,
 ve advanced our prices 5 per
 d after this date. All unfilled
 parts of orders on our books will
 d at the old rates.

nue to charge 5 per cent. more
 on Files. In future we shall not
 the indulgence of our friends in
 s, having lately increased our
 s as our goods are a standard for
 well as domestic markets, we
 lves to maintain our hard-earned
 so that parties handling our
 s can recommend them as
 anything at present in the trade.
 Thanks for favors, and wishing
 new year, we are, respectfully
 McCaffrey & Bro.

of BLACK DIAMOND FILE WORKS, }
 Michigan

35 to 43 Richmond Street,
PHILADELPHIA, Jan. 1, 1880. }

J. & H. Barnett beg to advise
re trade, &c., of their adoption
vised or American List" in place
the £ or English list, to take

effect on above date. This is done at the wish of many of our customers and with a desire to make a uniformity of price among manufacturers.

Grateful for past favors they hope for continued demands for the Black Diamond File.

NOTICE TO THE TRADE.

Office of HAYDEN & SMITH,
AUBURN, N. Y., Dec. 23, 1879.

GENTLEMEN: We have sold to The E. D. Clapp Manufacturing Company, of this city, our entire stock of Carriage Irons and materials of all kinds for the manufacture of Carriages and Wagons, to take effect Jan. 1, 1880.

We shall hereafter confine ourselves exclusively to the manufacture and sale of Hames, Saddlery Hardware and goods pertaining to that branch of the trade.

Believing that the E. D. Clapp Manufacturing Co. have facilities for supplying you with the best line of Carriage Goods in the market, we commend them to you, and ask for them a continuance of the liberal trade so many years given us by our friends and patrons. Respectfully yours,

HAYDEN & SMITH.

Office of The E. D. Clapp Mfg. Co.,
AUBURN, N. Y., Dec. 23, 1879.

To the Carriage Hardware Trade: Having purchased of Hayden & Smith, of this city, their entire stock of Carriage Materials, we shall, on January 1, 1880, succeed to that portion of their business.

All the Carriage Hardware known to the trade as "Auburn Goods," which Hayden & Smith have sold for the last fourteen years, has been manufactured by us, and we solicit a continuance of the liberal patronage which they have enjoyed from all parts of the United States and Canada.

We shall maintain the high standard which Auburn Carriage Hardware has reached in the past, and keep up with the times in the introduction of new and improved forms of forgings. Soliciting your orders, we are very truly,

The E. D. Clapp Mfg. Co.

Office for the sale of DUPONT'S GUNPOWDER,
70 Wall Street,
New York, Dec. 29, 1879.

DEAR SIR: The advance in raw material has compelled us to advance the price of our various grades of Powder, as per annexed list of prices, to which I beg your attention. Discounts and settlements as heretofore. Yours truly,

F. L. KNEELAND.

Prices for the City of New York, of all kinds of Gunpowder, manufactured by E. I. Du Pont de Nemours & Co., Wilmington, Delaware.

CANISTER POWDER IN CASES OF 25 EACH.

Diamond Grain, Nos. 1, 2, 3, & 4, in Canisters of 1 lb each.....	\$1.05
Eagle Duck Shooting, Nos. 1, 2, 3, & 4, in Canisters of 1 lb each.....	75
Eagle Duck Shooting, Nos. 1, 2, 3, & 4, in Canisters of 1 lb each.....	51
Eagle Rifle & Superfine Sporting, in Canisters of 1 lb each.....	75
Eagle Rifle & Superfine Sporting, in Canisters of 1 lb each.....	51
DuPont Rifle, Fg. FFF, in Canisters of 1 lb each.....	36
DuPont Rifle, Fg. FFF, in Canisters of 1 lb each.....	30
A. F. & Co., "Golden Pheasant," F, FF, & FFF, in Canisters of 1 lb each.....	31
A. F. & Co., "Golden Pheasant," F, FF, & FFF, in Canisters of 1 lb each.....	18

KEG POWDER.

Eagle Duck Shooting, Nos. 1, 2 and 3, in Kegs, 12½ lbs., Red Covers.....	\$7.50
Eagle Duck Shooting, Nos. 1, 2 and 3, in Kegs, 6½ lbs., Red Covers.....	3.75
Eagle Duck Shooting, Nos. 1, 2 and 3, in Canisters of 1 lb each.....	3.50
Eagle Rifle & Superfine Sporting, in Kegs, 12½ lbs., Blue Covers.....	3.75
Canon and Musket Powder, U. S. Government Proof.....	6.00
DuPont Rifle, FFF, FFF and "Sea Shooting," in Kegs of 25 lbs.....	4.25
DuPont Rifle, FFF, FFF and "Sea Shooting," in Kegs of 6½ lbs.....	1.75
DuPont Rifle, FFF, FFF in Canisters of 1 lb.....	1.70
A. F. & Co., "Golden Pheasant," F, FF, & FFF, in Kegs of 25 lbs.....	5.50
A. F. & Co., "Golden Pheasant," F, FF, & FFF, in Kegs of 12½ lbs.....	6.00
A. F. & Co., "Golden Pheasant," F, FF, & FFF, in Kegs of 6½ lbs.....	3.65
Shipping Powder, F, FF, FFF, FFFF and FFFFF, in Kegs of 25 lbs.....	3.65
Mining and Blasting Powder, (A), C, F, FF, FFF and FFFF, in Kegs of 25 lbs.....	3.15
Pulverized and Crystallized Saltpeter, Chemically pure, for Druggists' use, for Fireworks, &c., in bbls., 100 lbs. each.....	3.00
Safety Fuse, for Blasting, of Superior Quality, in packages of 100 feet and over, net cash.....	

Bruce & Cook have issued the following New Year's greeting to their friends in the trade, which is accompanied by a handsome office calendar for 1880.

HAPPY NEW YEAR.

The year 1880 opens before us the "good times" of commercial and industrial prosperity as no longer prospective, but present. Three years of abundant harvest, the last the fullest of all, have overflowed our granaries. The wants of Europe have opened ready demand for our surplus. To handle, transport and market this has set every wheel in motion.

The past few years of sore trial and loss have not been fruitless; railroads have been reorganized and economies studied; new adaptations of machinery give greater efficiency to human skill and labor. We are prepared, in this beginning of the new decade, to bring forces of heretofore unequalled vigor to aid us in our commerce.

We have some social lessons also, which well learned will give us both profit and comfort in the future. When disaster overtook us in 1873, men over the sea looked on and scoffed, or pitied the "reckless Americans"; but they with us have been compelled to drink deep the cup of loss and distress in all branches of human effort. Now, with the first return of our awakened industries, we hear the shout of the artisan, and the hum of machinery, in their glad response to our call for supplies. Nations as well as individuals will be kindlier for these lessons of interdependence; a competition that damages our neighbor damages ourselves. "All we are brethren."

The revival in business has had a natural

effect on prices of material; it may be that these have advanced too rapidly, but when 50,000,000 of people, who have been studying for seven years how to get along with the old things, begin to replace with new; when from 80,000 to 100,000 miles of railroad are looking for construction or repairs, all energies of supply will be taxed, and as the demand is sure to spread over the world, we may reasonably look for a continuance of business activities for a long time to come. We do not believe any serious recession in prices of manufactured goods can be hoped or feared this year.

In our own specialties—Iron, that first necessity of this age of machinery, has already fairly doubled in price, and seems disposed to keep on advancing; our own supplies have been exhausted, and hundreds of thousands of tons brought in from abroad, but there seems to be no sign of oversupply. Whatever of hesitation has been was but momentary, and everything seems to be taken, and, so far as we can judge, mainly into immediate consumption. The main current is not speculative, but substantial.

The same is true in Tin Plates. An advance from 14 to 25 sterling in Liverpool for Cokes, from 19 to 30 for Charcoal Plates, has scarcely checked the demand, and a supply for this country of 2,565,114 boxes for the first 11 months of 1879, against 1,804,201 boxes for the same time in 1878 and 1,770,524 boxes for the same time in 1877 leaves us without any accumulated stocks. All seems to have been at once absorbed by the uprising want.

Thus far the improvement in other countries has not been felt in the demand on England for Tin Plates, but it must soon come, and be added to the increasing volume from our own country. We look for no lower price in Tin Plates this year. Whatever fluctuations there may be, we are confident the average price must be higher for 1880 than is now ruling. Added to this increase of demand must be an advance in wages; labor must cost more in 1880 than in 1879, for it will cost more to live.

With all this new energy of successful industries in active motion about us, we tender to our friends and patrons, our New Year salutations and good wishes, with the comfortable assurance that not in an indefinite future, but in the glad present, we have a good time, and with such elements of permanence as justify our expectation of a profitable year's business. Our hope for you all is that it may prove so. Industry and economy will still be necessary, but industry and economy have the assurance of a wonderful good providence that they will be paid.

We inclose with this our calendar for 1880; please put it in the most conspicuous place on your desk, that whenever you are in want of any metal, you may think of and send us your order. Your friends,
BRUCE & COOK, 190 Water Street.
NEW YORK, January 1, 1880.

IRON.

American Pig.—For Forge Iron the demand continues very active, and prices of all descriptions have been further advanced. We hear of sales of 5000 tons Thomas Gray Forge at \$31, and of 3000 tons, brand not named, at the same price. Sales amounting to several hundred tons of No. 1 Foundry Iron have been made during the week at \$34.50, and we hear rumors of transactions at \$35, but are not able to trace them. Enough business at these high figures has been done, however, to establish a much higher range of prices than was current a week ago, and we quote on a very firm market as follows: Foundry No. 1, \$34 @ \$35; Foundry No. 2 X, \$32 @ \$33; Gray Forge, \$31 @ \$33.

Scotch Pig.—Sales are reported during the week of 500 tons Glengarnock, 400 tons Gartsherrie and 200 tons Eglington on private terms, besides sundry small lots said to be at very full figures. The arrivals of foreign iron at this port since our last writing amount to about 3000 tons but it is difficult to ascertain how much of it is Scotch, as English pig has been arriving pretty freely of late, and the brands are not classified in the reports. The market has gained strength and we quote a shade higher than last week's figures, viz.: Eglington, \$28 @ \$29; Summerlee, \$28.50 @ \$29; Glengarnock, \$30; Coltness, \$31; and Gartsherrie, \$29 @ \$30.

Rails.—The only transaction that has come to our notice since our last review of this market is a sale of 2000 tons Steel Rails at \$72.50. We quote: Steel, \$70 @ \$72.50; English Iron Rails, \$53 @ \$55, and American, \$54 @ \$58.

Old Rails.—Large orders for Old Rails to import are reported at \$38 for T's, and sales on the spot at \$36. Arrivals have been considerable. The market is very strong, with the tendency still upward for future delivery. We quote \$37.50 @ \$38.

Scrap.—Sales of several hundred tons No. 1 Wrought are reported at \$35. Although holders are looking for an advance, in sympathy with the general tone of the iron market, we have not heard of any higher quotations, and still quote No. 1 Wrought, from yard, \$35.

Manufactured Iron.—At a meeting of the Bar Iron Association of this city, held at the office of A. R. Whitney, on the 29th inst., the following list was adopted, to take effect January 1st, 1880:

PRICES OF IRON.

Net cash, 30 days. Subject to changes of market without notice.	
Common.....	3.2
Refined Iron.	
¾ to 2 in. Round and Square and 1 to 6 ¾ to 1 to 3 5	3.5
1 to 6 ¾ and 5-16 and 1 to 6 ¾ to 2 in.....	3.7
Large Rounds and Squares.	
2½ to 3½.....	3.7
3 to 3½.....	3.9
3½ to 4 Round and 3½ and 3½ Square.....	4.4

¾ and 4 Square.....	4.8
¾ to 4 Round.....	4.5
¾ and 5½ Round.....	5.1
¾ and 6.....	5.5
7.....	6.5

Rods.	
Round and Square, ¾, 11-16, ¾, 9-16, 7-16	3.6
Round and Square, ¾, 5-16, ¾, 3-16	3.4
Horse Shoe Iron.....	4.1

Hoops.	
¾ x 22.....	4.9
¾ x 20.....	4.7
1 x 18 & 19, 1½ x 18, 1½ to 2 x 18 & 18	4.4
1 to 2, 13 to 15 and thicker	4.3

Band Iron, 1 to 6 x 12 to 3-16.....	4.4
Ovals, Half Ovals, Half Rounds.	
¾ to 3½, 11-16 to ¾, 9-16 to ¾, 7-16, ¾, 5-16	3.9
3-9, 4-1, 4-3, 4-8, 5-3, 5-6	4.1

Scraps.	
¾ x 16, 14, 12, 10, 8, 6, 5, 4, 3, 2, 1, ¾, 5-16	3.6
¾ x 16, 14, 12, 10, 8, 6, 5, 4, 3, 2, 1, ¾, 5-16	3.6
¾ x 16, 14, 12, 10, 8, 6, 5, 4, 3, 2, 1, ¾, 5-16	3.6
¾ x 16, 14, 12, 10, 8, 6, 5, 4, 3, 2, 1, ¾, 5-16	3.6

Whitney's Best Iron.....	4.4
U. S. Nail Rods.....	6.5
Norway Nail Rods.....	6.5
Shapen.....	6.5
Bars.....	6.5
Beacon Shapes.....	6.5
Angle Iron, ordinary sizes, 1½ to 4 in.....	4.4
Tee Iron, ordinary sizes, 1½ to 4 in.....	4.4
Head Iron for Smoke Stacks, 3½, 4, 4½ in.....	5.5
Groove Iron, ¾, ¾, 1 and 1½.....	4.4
Tyre Steel, ordinary sizes.....	4.4
Toe Caulk Steel.....	5.5
Sleigh Shoe Steel.....	5.5
Spring Steel.....	6.5

METALS.

Copper.—Our market has remained uniformly quiescent during the last week of the year, sales of Lake Superior being restricted to 100,000 lb at 21½¢ @ 21½¢, the closing figure, also the nominal quotation for Baltimore. London has varied little; the cable quotes at the close Chili Bars, £67, and Best Selected, £73. Manufactures of Copper are unaltered.

Tin.—Activity has been restricted by the dull holiday feeling, and the sales have been of little importance, while the receipts continue ample; the market, consequently, wound up heavily at the following rates for large lots: Straits, 20½¢ @ 21¢; English Refined, nominal; ditto Common, 20½¢ @ 20½¢; and Banca, 23½¢ @ 24¢. London cables Straits at the close £91. Tin Plates have been active and very firm. We quote large lines, ordinary brands, per box: Charcoal Bright, \$8.25 @ \$8.50; ditto Termes, \$7.25 @ \$7.50; Coke Tin, \$7.37½ @ \$7.50; and ditto Termes, \$7.37½.

Lead.—Nothing worth recording has been done during the week, but prices remain fully sustained at 5½¢ for Common Domestic, and 6¢ for Refined. Total production in the United States for 1879 is estimated by the best authorities at something like 85,000 to 90,000 tons. On the Continent of Europe a syndicate has been formed to sustain the price of Lead. Manufacturers' prices remain as last noted. We quote: Bar, 6½¢; Pipe, 7½¢; Sheet, 8¢; Tin-lined Pipe, 15¢, all less 10¢ to the trade. No. 1 Solder, 12¢.

Spelter and Zinc.—There has transpired absolutely nothing since our last report. We continue to quote, nominally, Common Domestic Spelter, 6¢ @ 6½¢, and Silesian, 6½¢ @ 6½¢. There is none of the latter offering. We quote: Sheet Zinc, 8¢ @ 8½¢.

Nickel.—This metal has remained well sustained and moderately active at \$1.40.

Antimony.—Has been moving off steadily within the range of 16¢ @ 20¢, as to quantity and brand.

COAL.

The trade during the past week has undergone very little change, so little in fact as to make it hardly worth noticing. The tonnage for the week is somewhat smaller than it was last week. This is owing to the fact that some of the companies have suspended work for the time being, while others have curtailed their production to a certain extent. There is no inquiry for Coal, the few buyers that come into the market are those who must have Coal for some reason or other. Those who can wait do so. Dealers do not like to make quotations, and we find it very difficult to get any prices which are anywhere near the actual selling figures. There are circulars, but they are so far from representing the actual market prices that their publication seems absurd. The Philadelphia and Reading, it would seem, wish to make it appear that there is an advance, or that they have advanced the price of their Coals. So far as we can hear, the actual asking price is from \$3.40 @ \$3.50 for Lehigh Stove. Softer Coals were quoted yesterday at \$3.25 @ \$3.30 for the time being, but no one could be found who was willing to make a quotation for publication, or one that would be good for 24 hours. The truth of the matter seems to be that each one is selling for as much as he thinks he can get from his customer, ready at any moment to "meet the market" in case there appears to be any difficulty in closing the bargain. The continued warm weather has made the retail trade dull, and prevented the working off of stocks.

OLD METALS, PAPER STOCK, &c.

In the Old Metal market there is quite an active demand for Iron, but we note no change in prices. The Rag and Paper Stock market is very firm, and an advance in prices is anticipated.

The purchasing prices offered by dealers for Old Metals are as follows:

Copper, heavy.....	per lb. \$0.18 @ .19
Copper Bottoms.....	.15 @ .16
Yellow Metal.....	.10 @ .11
Brass, heavy.....	.12 @ .13
Brass, light.....	.08 @ .09
Composition, heavy.....	.15 @ .16
Lead, heavy.....	.04 @ .04½
Tea Lead.....	.04 @ .04½
Zinc.....	.03½ @ .03¾

Pewter, No. 1.....	.11 @ .12
Pewter, No. 2.....	.07 @ .08
Wrought Iron.....	per ton \$28.00 @ \$30.00
Light do.....	16.00 @ 18.00
Stove Plate.....	12.50 @ 13.50
Machinery do.....	15.00 @ 16.00

The prices current for Rags &c., are as follows:

Canvas, Linen.....	per lb. 5½¢ @ 6¢
White Cotton, No. 1.....	5½¢ @ 6¢
White, No. 2.....	5¢ @ 5½¢
No. 3.....	4½¢ @ 5¢
Seconds.....	4¢ @ 4½¢
Mixed, Woolen.....	3¢ @ 3½¢
Mixed Rags.....	2¢ @ 2½¢
Gunny bagging.....	3¢ @ 3½¢
Juste butts.....	3½¢ @ 4¢
Kentucky bagging.....	3½¢ @ 4¢
Book Stock.....	2½¢ @ 3¢
Newspapers.....	1½¢ @ 2¢
Waste Paper and Scraps.....	¾¢ @ 1¢
Kentucky Bale Rope.....	4¢ @ 4½¢
Tarred Shaking.....	1¢ @ 1½¢
Cass Rope.....	2½¢ @ 3¢

IMPORTS.

Of Hardware, Iron, Steel and Metals into the Port of New York, for the Week ending Dec. 30, 1879:

Baker Hermann & Co.	Netherlands Trading Society.
Hdw., cs., 69	Old rails, pcs., 138
Hdw., cs., 5	Nevada Bank of San Francisco.
Armstrong & Son	Pig, tons, 300
Hdw., cs., 2	Ogden & Wallace.
Carrington & Co.	Bar iron, bbls., 512
Hdw., bx., 1	Bars, 2057
Creed Eugene.	Openheim M. & Co.
Nails, bags, 80	Pig, tons, 150
Curley J. & Bro.	Pierson & Co.
Cutlery, cask, 1	Sheet iron, bbls., 546
Dreyfus, Weiller & Co.	Prosser Thos. & Sons.
Hdw., cs., 17	Iron rings, bbls., 5
Fales T. J.	Stephens & Reynolds.
Gun stocks, crates, 3	Pig, tons, 200
Folsom H. & D.	Wire rods, bale, 1
Guns, cs., 5	Weddington L. & Co.
Franken Henry.	Rails, 300
Nails, pkgs., 1	Williamson Jas. & Co.
Plov, cs., 1	Pig, tons, 200
Graef Cutlery Co.	Wolf R. H. & Co.
Mds., pkgs., 5	Rods, lots, 698
Haigh J. Lloyd.	Order.
Wire, bbls., 658	Bars, 3104
Herrmann H. & Co.	Blooms, 470
Mds., pkgs., 86	Bundles, 654
Hoe R. & Co.	Cases, 33
Mds., pkgs., 2	Fish plates, 400
Milliken & Smith.	Hoop iron, a quantity
Wire, bbls., 1559	Hoop iron, bbls., 2843
Montgomery J. M.	Iron pipe, pcs., 30
Hdw., cs., 1	Old rails, 7139
Moore John.	Old rails, pcs., 1639
Machine, 1	Old rails, pcs., 7229
Moore & P. Sons.	Old Rails, tons, 521
Gun stocks, crates, 3	Ore, tons, 1346
Hdw., pkgs., 4	Pig, tons, 1363
Pin, Forwood & Co.	Rail ends, a quantity
Hdw., cs., 23	Rails, 3560
Pussy & Jones.	Rod iron, bbls., 614
Machinery, pcs., 4	Scrap, tons, 864
Rogers Henry.	Sheet iron, bbls., 133
Hdw., cs., 1	Sheet iron, p's, 350
Seligman J. W. & Co.	Sp'geleisen, tons, 745
Iron ware, pkgs., 933	Wrought scrap, a quantity
Sellers W. B.	
Mds., pkgs., 1	
Schoverlin, Daly & Gales.	
Mds., pkgs., 14	
Schuyler, Hartley & Co.	
Mds., pkgs., 1	
Smith A. & Sons Carpet Co.	
Machinery, cs., 12	
Stewart A. T. & Co.	
Machinery, pkgs., 3	
Strassburger, Reiter & Co.	
Hdw., pkgs., 1	
Upton, Walton & Co.	
Wire coils, 6	
Ward Askins.	
Hdw., cs., 8	
Waterbury L. & Co.	
Machinery, cs., 85	
Wetzel M. W.	
Mds., pkgs., 3	
Wiebusch & Hilger	
Hdw., cs., 1	
Cutlery and Hdw.,	
Wolf H. & Co.	
Mds., pkgs., 5	
Woolley W. W.	
Wire netting, rolls, 52	
Order:	
Bolts and nuts, cs., 16	
Cannel coal, tons, 15	
Chains, cs., 50	
Grindstones, 75	
Gun barrel molds, cs., 7	
Guns and gun furniture, cs., 5	
Hdw., cs., 6	
Machine, cs., 1	
Wire, cs., 1	

Baring Bros. & Co.	Rods, bbls., 858
Brown Wm.	Bars, 3
Bundles, 200	Packages, 115
Carey & Moon.	Bundles, 148
Casks, 22	Mosher H. M.
Bars, 1	Bundles, 1
Bundles, 1	Cases, 1
Naylor & Co.	Bars, 10
Cases, 20	Prosser Thos. & Sons.
Bands, 186	Cases, 1
Steelware, pkgs., 22	Woodford W. O.
Bars, 42	Bundles, 253
Cases, 18	Casks, 15
Rails, 1440	Rods, bbls., 342
Rods, coils, 576	

Baring Bros. & Co.	Tin plates, bxs., 1319
Tin slabs, 405	Berbecer J. & Co.
Hdw., cs., 3	Byrne Jos. & Co.
Tin plates, bxs., 630	Cort N. L. & Co.
Tin plates, bxs., 23	de Rivera J. & Co.
Old brass, bxs., 2	Old copper, bbls., 2
Dickerson & Van Dusen.	Tin plates, bxs., 740
Tin andterne plate, bxs., 720	Ginnel H.
Hdw., pkgs., 3	Howard Bros. & Held.
Hdw., cs., 3	Phelps, Dodge & Co.
Tin plates, bxs., 3522	Black taggers, bxs., 100
Pratt Chas. & Co.	Tin plates, bxs., 731
Pophitz L. & Co.	Copper, cs., 2
Tucker R. A. & Co.	Old copper, hds., 1
Order:	

FOREIGN.

FRANCE.

(Moniteur des Interests Matériels.)
PARIS, Dec. 14, 1879.—Metals.—The weather has lost a little of its extreme severity, and business begins to look up again slightly. Metals have been inactive during the week, but generally firm. Copper has been remarkably steady. We quote: Chili Bars, 172.75 @ 177.50 francs the 100 kilos; Best Selected, 187.50; and pure Cough Ore, 175. Havre has been firm; they quote Chili Bars, 172.50 @ 175. Marseilles is sustained as follows: Spanish in slabs, 100; Red Tokat, 160; small Refined Ingots, 170; Copper Sheathing, 190; Yellow metal ditto, 180; and Copper Bolts, 200. Tin.—After a few further fluctuations, the market has become steadier. We quote at Paris, Banca and Billiton, 247.75; Straits, 257.50; Australian, 257.50; and English at Havre or Rouen, 251.50. Marseilles has been without much doing; they quote Straits, 240 @ 245; Billiton, 240 @ 245; English, 252.50; and Banca, 245. Lead.—Great firmness is noticeable in all the French markets. We quote here French and German, 44.75; other sorts, 44. Spanish commands at Havre 43.50 @ 42.25, and manufactures, 46 @ 47. Spelter.—No change of note has occurred in this metal, which remains generally scarce and firm; the demand is a trifle less than the season. We quote Silesian, 52 @ 50 francs. Marseilles is firm at 60 @ 62 francs for Sheet Zinc, and 38 @ 42 for Old Remelted. Iron.—Not much change can be expected at this time of the year, nor has there been any of importance. Prices are firmly upheld by producers who, in various instances, ask more. Thus the Firming, Chatillon-Commentary and Creusot works have all obtained better figures for late sales of Rails &c. In some cases the advance has been considerable. In the Champagne district the owners of forges have declined to go on at present prices beyond the present month. Nail makers and machine shops, as well as chain manufacturers are screwing up prices one after the other. In the Meurthe and Moselle, Pig Iron No. 3 is firm at 55 francs. On all hands there is a blowing in of furnaces with respect to the setting to work again of establishments which had been dormant for many years. Taking together all these signs of the times, the unanimity of opinion which seems to prevail with respect to the future in France and the undercurrent of confidence shown in individual transactions of magnitude, and we presume we are safe in assuming that the new year will, from its commencement, develop great activity and strength among us. The advances from neighboring countries are all more or less imbued with a similar spirit. Dealers and consumers are gradually losing all hesitation and replenish stocks, resigned as they seem to be not to do better by delaying their purchases. Coal.—Coal mining is at present favorably situated; the demand both for industrial and household purposes is quite brisk, and the severity of the winter has been a great hindrance to transportation, while the extreme cold gave an extraordinary impulse to consumption. The tendency of prices has consequently remained a decidedly upward one.

BELGIUM.

(Revue Industrielle.)

BRUSSELS, Dec. 14, 1879.—Iron.—Prices are still improving; orders abound, and with the exception of architectural iron works, pretty much every body is busy in the branch. We quote at Brussels, Iron No. 1, 15 francs; No. 2, 14.50; No. 3, 14.25; Sheet Iron, 15 francs; Steel Rails, 17.75 @ 17.50; Hoops, 19.50 @ 21.50; Belgian Pig Iron, 7.10 @ 7.25; English ditto, 6.8 @ 7. The dephosphorization process of Thomas & Gilchrist has proved eminently successful at the Angleur Steel Works. We are assured that the Couillet Company was only awaiting the result to take in hand this improvement in manufacture. There has been great activity at Charleroi; a fortnight ago the stock of Pig Iron was 80,000 tons there. There is none left to-day. One of the papers here ironically remarks that the government, after being disappointed in getting its 20,000 tons of Steel Rails at the time, and not being able to get them for less than 180 francs now, had better return to Iron Rails. We are inclined to believe that the government could not do them at this precise moment cheaper than 180, some works being no doubt quite willing to sell the government somewhat below the market. Coal.—Everything seems to combine for the moment to drive up the price of Coal. There is in the first place the severe cold and the growing demand from the iron works and glass makers. Canal navigation is closed, throwing an immense amount of business upon the hands of our railroads. It is probable that they are with freight cars, and many of these in a poor condition.

GERMANY.

(Borrenshalle.)

HAMBURG, Dec. 13, 1879.—Metals.—The usual dullness in trade in the month of December has been intensified this year by the early and extremely severe winter, and the reports of hardship in various parts of Germany, especially in Upper Silesia, where a portion of the harvest has been superadded to this a disastrous failure—that of Messrs. Godeffroy & Sons, one of the oldest and largest houses in this city, whose liabilities amount to between 15,000,000 and 20,000,000 of marks. As most of their assets are sold to be mortgaged, the prospect of a decent dividend is not of a promising nature. The heaviest losses fall upon two leading London banking houses. In other respects the outlook is not dissatisfying, crops in general having been fair in Germany, and business reviving on a safe business—i. e., the exhaustion of stocks in dealers' and consumers' hands. After we shall have made a couple of weeks' headway into the new year, we expect business to be resumed most actively on all hands. Copper has been steady; we quote the various sorts of English and Swedish Copper, 74 @ 75 marks the 50 kilos; Berlin quotes English and Australian, 71 @ 74, and Mansfield, 75 @ 75.50. Tin is still at the ensuing rates in this market: Banca, 103 @ 105; English, 102 @ 103. Common, 102 @ 104 for Refined. Berlin quotes Banca, 92.50 @ 100, and English, 99 @ 100. Lead.—Great firmness is observable in the German markets. Berlin quotes Tarnowitz, Harz and Schönbach, 17.75 @ 18 marks. We are here, 27.50 @ 19 with the various sorts. Spelter remains scarce and firm. Breslau quotes 18.80 @ 18.90; Berlin, 20 @ 20.75, and we are here, 19.50 @ 20.

AUSTRIA.

(Austrian Trade Journal.)

VIENNA, Dec. 14, 1879.—Metals.—Not much of a change can be reported in the situation of the Austrian iron market, which has remained dull but firm. Prices are unaltered, with the sole exception of Spiegeleisen, which has been quoted higher by the Corinthian Co. since last week. The negotiations between our iron masters and the railroads to Trieste have been successful, a freight reduction of 6 kreuzers having been made for the future. This reduction does not seem to us large enough to allow our works to compete in that direction with those of Rhenish Prussia and Westphalia. Our rail makers have not yet come to an understanding with the railroads in need of new rails. Pig Iron still lacks activity; prices are unaltered. The Inneberg Co., as an exceptional case, has made some sales of it at 45 @ 47 florins, to arrive, which is a slight improvement. Bar Iron drags along slowly, owing to the season. Thin Sheet Iron is doing tolerably well. The machine shops are not busy generally speaking; some few have, however, received orders for breweries and sugar refineries. There is an agent for an English concern at Vienna who states that he has an order for 40,000 tons of Steel Ingots for India, and is trying to execute the same in this country. Metals have been firm but quiet. The only thing new is the formation of a Lead Syndicate on the Continent, of which some leading producers in Germany are members, among others the Rhenish-Nassau, the Stolberg, Metternich, Commen and Herbot & Co. We quote Copper, 73 @ 75; Tin, 118 @ 120; Lead, 20 @ 23; Spelter, 21 @ 23.50; Sheet Zinc, No. 8, 26 @ 27.50; No. 9, 25 Nickel, 4.50 per kilo; Minimum, 25 @ 26 florins, all the 100 kilos, and all less 2 % for cash.

EAST INDIES.

(Giffitts, Wood & Co.)

SINGAPORE, Nov. 27, 1879.—Tin.—This metal receded till it touched \$25.75, rallied to \$26.75, and has now gone back to \$27.125, at which business has been done to-day. The buying has been mainly for the United States. Freight to London are firm at 25 for dead weight. There is not much cargo offering by sailing ship, but an advance will

probably be established for the next ship laid on. For New York the McLeod has been fixed at current rates, but there is some doubt of her engagement being fulfilled. A large quantity of cargo is awaiting ship room for New York. The Series and W. H. Dietz, which were fixed some time ago to load for that port, have not yet arrived. The Winona, for Boston, took 220 piculs Tin; the steamer Glenartney, for New York, 100 piculs; the Glencoe, for ditto, 162, and the Deucalion, 75; Exchange has advanced to 3/10 3/4 for 4 months' sight bank bills, and 3/11 for 6 months' sight private paper. There were shipped from the Straits settlements to the United States during the first 10 months: 93,855 piculs of Tin, against 51,827 in 1878; 53,913 in 1877; 38,919 in 1876; 48,178 in 1875; 31,395 in 1874; 39,425 in 1873; 47,560 in 1872; 47,302 in 1871, and 48,651 in 1870.

The Lehigh Valley Iron Works.

A correspondent of the Philadelphia Ledger sends that paper the following gossip about the Lehigh Valley Iron Works:

There are 51 furnaces in the valley, and during that year they produced 416,907 net tons, while the capacity for all amounts to nearly 630,000 tons. At present all the furnaces are either in operation or preparing to commence work, and, if the demand for iron continues, the product the coming year will be the heaviest of any previous year.

The improved condition of things can be illustrated by referring to the operations of the Allentown Iron Company. This company has five furnaces, with a capacity of 1000 tons of pig iron per week, and, up to within a few months, only one furnace was kept in blast. The shares of the company, during the depression, fell to a very low figure, and its paper went to protest. At the present time all of the furnaces are in blast and producing their full capacity, and the stock of the company has gone up again to quite a good figure. Just before these works commenced with all their furnaces, pig iron sold as low as \$18 per ton, and the same quality is now bringing over \$30.

The Allentown Rolling Mill Company have in full operation two blast furnaces, with a capacity of 500 tons per week; an iron rail mill, turning out 500 tons of rails per week; a mill for the manufacture of merchant bar iron, capable of producing 250 tons per week; also a spike, bolt, nut and rivet factory, and foundry and machine shop, turning out over 100 tons of manufactured work weekly. All these varied enterprises are in full blast, and give employment to about 1200 men, who receive from 15 to 20 per cent. more wages than they did last spring. This increase in the price of labor, we might say here, prevails throughout the valley, and has had much to do, of course, with the present prosperity of other enterprises not only in the immediate vicinity of the mills, but throughout the country.

The other important works here is the Lehigh Iron Company, which runs two blast furnaces of a capacity of about 500 tons per week. This company, like all other furnaces and mills, have a brisk demand for their iron, and at remunerative prices.

The Crane Iron Works, at Catasauqua, are now working night and day to meet contracts already entered into. Five furnaces are now in full blast, the five having the capacity of producing about 1200 tons of pig iron per week. One furnace, which was torn down, will soon be rebuilt, and it is the intention of the company to introduce all the modern improvements, including Whitwell's hot-blast stove. This stove is made of fire-brick, with sheet-iron castings, and is considered not only more durable, but giving a greater amount of heating surface. One of them is already in use at these works. These works were started 40 years ago, and the two first furnaces put in operation are now in full blast. The quality of iron produced here always commands the highest prices. Over 400 men are employed in these works, and, like those in other places, are receiving from 15 to 20 per cent. in advance of last spring's prices.

The Catasauqua Iron Manufacturing Company is also busily engaged in meeting demands made upon them for their productions. This company have 2 mills, 27 puddling furnaces, 9 heating furnaces and 7 trains of rolls. The bar and boiler iron manufactured is considered of the highest grade, and at present the works are turning out iron at the rate of over 25,000 tons per annum. The company also manufacture car axles and shafting iron. To-day orders were received that will keep all the works running night and day far into next year.

A short distance up the valley, and above Catasauqua, are the extensive works at Hockendauqua, known as the Thomas Iron Works. Here there are 6 furnaces, and at Lock Ridge 2 more, the combined works producing over 2000 tons of pig iron per week.

There is still further up the valley the Coplay Iron Company, with three furnaces, and the Carbon Iron Company (limited), with three furnaces, the two establishments producing over 1300 tons per week.

The same briskness prevails in Bethlehem as in Allentown, and there is much cheerfulness among business men at the improved state of trade. The Bethlehem Iron Company have works as extensive, if not more so, than any in the valley. In their No. 1 mill they have 13 double puddling furnaces and one single puddling furnace, nine heating furnaces, one 21-inch train of rolls for iron rails and merchant iron, the entire capacity being about 22,500 net tons per annum. In their mill No. 2 they have two seven-ton Bessemer steel converters, two Siemens melting and eight heating furnaces, and two 32-inch blooming train of rolls, having a capacity of over 72,000 net tons. The Bessemer steel converters made their first blow October 4, 1873, and a few days afterward the first steel rail was rolled. This company also run the Northampton Furnace and the North Penn Furnace, at Bingen, on the line of the North Pennsylvania Railroad. Each furnace has one stack and is running to its full capacity.

At the commencement of the brisk season in iron, shipments were made from England, but as the furnaces that were out of blast get to work the demand for English iron will cease to a great extent, not only because of our own establishments being capable of supplying the demand, but from the fact that American iron is considered the best.

The German Railway Policy and the Iron Trade.

Prince Bismarck long since formulated a scheme to absorb the whole of the German railways by the Government. Numbers of these lines are already owned by the State, and it would appear that the German Chancellor of the Exchequer, under the influence of Prince Bismarck, is about to purchase all the German railways on Government account. A leading Berlin organ, writing on this subject, wisely objects to the transfer of the railways to the Government, and forcibly points out, in the following article, the injury the Iron Trade will sustain by this innovation:

This not only places some hundred thousand families more under Government control, but, which is equally bad, makes a large number of mines, foundries, engine and carriage works, &c., absolutely dependent on Government custom.

What is to be the position of the Government, as buyers on a large scale of railway plant and materials, in relation to private manufacturing industry? Some time ago the Minister of Public Works issued an apparently reasonable order, that home ironmasters only should be invited to tender for the supply of materials for State railways. But this restriction, coupled with the new Protectionist duty, clearly gives the iron trade an undue advantage; and if all, or nearly all, the railways are to become State property, a continued exclusion of foreign competition will be obviously an injustice to the community at large. It is a well-known fact that German ironmasters systematically divide Government railway work between them, fixing the prices, and tendering by mutual agreement. Recent contracts for the supply of rails for State railways show an increase of 15 to 17 marks per ton above the price at which private railways, where the competition was open, were recently supplied. According to the statement of a practical man there are two German works (Krupp's and Bochum's) which could with the greatest ease meet the requirements of all the railways of Germany.

If it be urged that foreign competition having been excluded by the new tariff, it is rather the Government that will have to submit to the ironmasters, this argument is easily disposed of. When the Government are the only possible customers of numerous works, they will easily succeed in breaking any coalition that may be formed against them; while to make the tariff illusory, they have it always in their power to reduce railway freight for foreign articles, and raise them for home produce. The prerogatives of the new Railway Council will hardly be great enough to prevent this, and the upshot of it will be that ironmasters, mine owners and others engaged in providing railway plant will soon be driven to the same course as the Railway Companies and sell out. In such a case it is probable that their capital will be reinvested in countries where fewer impediments are thrown in the way of individual enterprise, and where the Government does not extend its action to the pursuit of industry and commerce.

Protection in Brazil.

Extracts translated from Brazilian newspapers of recent date show that the new tariff of that empire is thoroughly protective in its intention and practical working, and that the influence of our Centennial Exposition converted the governing powers of Brazil to the idea of cultivating domestic manufactures, and that large quantities of industrial machinery have been imported steadily ever since. At the latest accounts Brazil had thirty-four cotton factories in full operation. This change of policy is of more consequence to England than to the United States, for although our exports of domestic fabrics to the empire had been growing rapidly, the Brazilian markets for manufactured goods were chiefly supplied from Europe, the leading commercial interest being decidedly English. This is a very important matter, however, in another aspect, when we consider the great quantities of coffee, sugar, molasses, India rubber, drugs and fine woods imported into this Republic from that country. The foreign commerce of Brazil has been very heavily against us, and this adverse balance has served as one of the elements of settlement of the balance due us from England, as the latter country rules all international exchanges. If the Brazilian industries reduce the market there for our own products, of course the balance against us must become still heavier, unless we shall curtail our imports.

It is among the most singular developments of British enterprise that it leads the way with great favor in supplying Brazil with industrial machinery for the manufacture of the very goods on which British merchants chiefly rely for their Brazilian trade. It is probable, however, that very much of this may be second-hand machinery from abandoned mills, or that has been superseded by later inventions adopted from American models, as it is known that machinery of that kind was offered at low rates to our own Southern mills. Certain it is that in labor-saving contrivances of all kinds, American machinery is ahead of all competition. Since, therefore, an increase of our exports to Brazil seems to be a necessity, notwithstanding the Brazilian protective tariff, it would be wise if all classes of our metal workers were to turn their attention to the subject at once on as large a scale as possible.—Philadelphia North American.

Spanish Ironstone for Cyfarthfa.—It is stated that Messrs. Crawshaw have entered into a contract for a supply of 150,000 tons of Spanish ore from Bilbao, the first consignment of which has arrived at Cardiff.

A number of leading ironmasters and manufacturers of Middlesbrough accuse the officials of the Stockton and Middlesbrough Corporations Water Boards of giving expression to their lack of faith in their own water meters in rather a peculiar manner. It appears that they were in the habit of adopting the simple and effective expedient of pushing the hands of the instruments until the indications of the meter coincided

with their notions concerning the quantity of water which ought to have been used. We need not add that they made out their bills on the basis of their corrected readings.

A French artisan, M. Martin, of 56 West Houston street, N. Y., is reviving in this country the ancient and almost forgotten art of armor making, and has lately done some work in this line of remarkable beauty and fidelity to mediæval patterns. Arms and armor are rapidly becoming popular as decorative material, and as trophies of arms having undoubted historical associations are quite unattainable by ordinary collectors of bric-a-brac, the demand for good modern reproductions in this line promises to call for so much art work in sheet metal that it is a pity we have so few sheet metal workers who are artists.

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NEW YORK WHOLESALE PRICES, DECEMBER 30, 1879.

METALS.

IRON. —DUTY: Bars, 1 to 14c. # B; Sheet, Band and Scrolling, 15 to 16c. # B; provided, that none of the above iron shall pay a less rate of duty than 35 per cent. Fig. # B; ton: Polished Sheet, 3c. # B; Wrought Scrap, 10c. # B; Cast Scrap, 8c. per ton. Railroad 70c. # B; Boiler and Plate, 15c. # B.	
Pig Iron. —AMERICAN NOMINAL.	
Foundry No. 1.....	ton 31.00 @ 35.00
" No. 2.....	ton 31.00 @ 35.00
Gray Forge.....	ton 31.00 @ 35.00
SCOTCH.	
Eglinton.....	ton 28.00 @ 30.00
Coltness.....	ton 31.00 @ 35.00
Glenasmole.....	ton 31.00 @ 35.00
Garbharr.....	ton 29.00 @ 30.00
ITALY.	
Iron.....	ton 34.00 @ 38.00
Steel.....	ton 30.00 @ 32.00
Old Mills.....	ton 37.00 @ 39.00
Scrap.	
Wrought Scrap, from yard.....	@ 35.00
Star Iron, from Store.	
Common Iron.....	# B 3.20
1 to 2 in. round and square.....	# B 3.20
1 to 6 in. 1/2 to 1 in.....	# B 3.20
Refined Iron.....	# B 3.20
1 to 2 in. round and square.....	# B 3.20
1 to 6 in. 1/2 to 1 in.....	# B 3.20
Rods—1/2 to 1 in. round and square.....	# B 4.00
Rods—1 to 6 in. round and square.....	# B 4.00
Norway Nail Rods.....	@ 4.00

Sheet Iron.	
Nos. 10 to 20.....	Common American # B 4.00
21 to 24.....	Common American # B 4.00
25 to 28.....	Common American # B 4.00
29 to 32.....	Common American # B 4.00
33 to 36.....	Common American # B 4.00
37 to 40.....	Common American # B 4.00
41 to 44.....	Common American # B 4.00
45 to 48.....	Common American # B 4.00
49 to 52.....	Common American # B 4.00
53 to 56.....	Common American # B 4.00
57 to 60.....	Common American # B 4.00
61 to 64.....	Common American # B 4.00
65 to 68.....	Common American # B 4.00
69 to 72.....	Common American # B 4.00
73 to 76.....	Common American # B 4.00
77 to 80.....	Common American # B 4.00
81 to 84.....	Common American # B 4.00
85 to 88.....	Common American # B 4.00
89 to 92.....	Common American # B 4.00
93 to 96.....	Common American # B 4.00
97 to 100.....	Common American # B 4.00
101 to 104.....	Common American # B 4.00
105 to 108.....	Common American # B 4.00
109 to 112.....	Common American # B 4.00
113 to 116.....	Common American # B 4.00
117 to 120.....	Common American # B 4.00
121 to 124.....	Common American # B 4.00
125 to 128.....	Common American # B 4.00
129 to 132.....	Common American # B 4.00
133 to 136.....	Common American # B 4.00
137 to 140.....	Common American # B 4.00
141 to 144.....	Common American # B 4.00
145 to 148.....	Common American # B 4.00
149 to 152.....	Common American # B 4.00
153 to 156.....	Common American # B 4.00
157 to 160.....	Common American # B 4.00
161 to 164.....	Common American # B 4.00
165 to 168.....	Common American # B 4.00
169 to 172.....	Common American # B 4.00
173 to 176.....	Common American # B 4.00
177 to 180.....	Common American # B 4.00
181 to 184.....	Common American # B 4.00
185 to 188.....	Common American # B 4.00
189 to 192.....	Common American # B 4.00
193 to 196.....	Common American # B 4.00
197 to 200.....	Common American # B 4.00
201 to 204.....	Common American # B 4.00
205 to 208.....	Common American # B 4.00
209 to 212.....	Common American # B 4.00
213 to 216.....	Common American # B 4.00
217 to 220.....	Common American # B 4.00
221 to 224.....	Common American # B 4.00
225 to 228.....	Common American # B 4.00
229 to 232.....	Common American # B 4.00
233 to 236.....	Common American # B 4.00
237 to 240.....	Common American # B 4.00
241 to 244.....	Common American # B 4.00
245 to 248.....	Common American # B 4.00
249 to 252.....	Common American # B 4.00
253 to 256.....	Common American # B 4.00
257 to 260.....	Common American # B 4.00
261 to 264.....	Common American # B 4.00
265 to 268.....	Common American # B 4.00
269 to 272.....	Common American # B 4.00
273 to 276.....	Common American # B 4.00
277 to 280.....	Common American # B 4.00
281 to 284.....	Common American # B 4.00
285 to 288.....	Common American # B 4.00
289 to 292.....	Common American # B 4.00
293 to 296.....	Common American # B 4.00
297 to 300.....	Common American # B 4.00
301 to 304.....	Common American # B 4.00
305 to 308.....	Common American # B 4.00
309 to 312.....	Common American # B 4.00
313 to 316.....	Common American # B 4.00
317 to 320.....	Common American # B 4.00
321 to 324.....	Common American # B 4.00
325 to 328.....	Common American # B 4.00
329 to 332.....	Common American # B 4.00
333 to 336.....	Common American # B 4.00
337 to 340.....	Common American # B 4.00
341 to 344.....	Common American # B 4.00
345 to 348.....	Common American # B 4.00
349 to 352.....	Common American # B 4.00
353 to 356.....	Common American # B 4.00
357 to 360.....	Common American # B 4.00
361 to 364.....	Common American # B 4.00
365 to 368.....	Common American # B 4.00
369 to 372.....	Common American # B 4.00
373 to 376.....	Common American # B 4.00
377 to 380.....	Common American # B 4.00
381 to 384.....	Common American # B 4.00
385 to 388.....	Common American # B 4.00
389 to 392.....	Common American # B 4.00
393 to 396.....	Common American # B 4.00
397 to 400.....	Common American # B 4.00
401 to 404.....	Common American # B 4.00
405 to 408.....	Common American # B 4.00
409 to 412.....	Common American # B 4.00
413 to 416.....	Common American # B 4.00
417 to 420.....	Common American # B 4.00
421 to 424.....	Common American # B 4.00
425 to 428.....	Common American # B 4.00
429 to 432.....	Common American # B 4.00
433 to 436.....	Common American # B 4.00
437 to 440.....	Common American # B 4.00
441 to 444.....	Common American # B 4.00
445 to 448.....	Common American # B 4.00
449 to 452.....	Common American # B 4.00
453 to 456.....	Common American # B 4.00
457 to 460.....	Common American # B 4.00
461 to 464.....	Common American # B 4.00
465 to 468.....	Common American # B 4.00
469 to 472.....	Common American # B 4.00
473 to 476.....	Common American # B 4.00
477 to 480.....	Common American # B 4.00
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533 to 536.....	Common American # B 4.00
537 to 540.....	Common American # B 4.00
541 to 544.....	Common American # B 4.00
545 to 548.....	Common American # B 4.00
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553 to 556.....	Common American # B 4.00
557 to 560.....	Common American # B 4.00
561 to 564.....	Common American # B 4.00
565 to 568.....	Common American # B 4.00
569 to 572.....	Common American # B 4.00
573 to 576.....	Common American # B 4.00
577 to 580.....	Common American # B 4.00
581 to 584.....	Common American # B 4.00
585 to 588.....	Common American # B 4.00
589 to 592.....	Common American # B 4.00
593 to 596.....	Common American # B 4.00
597 to 600.....	Common American # B 4.00
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605 to 608.....	Common American # B 4.00
609 to 612.....	Common American # B 4.00
613 to 616.....	Common American # B 4.00
617 to 620.....	Common American # B 4.00
621 to 624.....	Common American # B 4.00
625 to 628.....	Common American # B 4.00
629 to 632.....	Common American # B 4.00
633 to 636.....	Common American # B 4.00
637 to 640.....	Common American # B 4.00
641 to 644.....	Common American # B 4.00
645 to 648.....	Common American # B 4.00
649 to 652.....	Common American # B 4.00
653 to 656.....	Common American # B 4.00
657 to 660.....	Common American # B 4.00
661 to 664.....	Common American # B 4.00
665 to 668.....	Common American # B 4.00
669 to 672.....	Common American # B 4.00
673 to 676.....	Common American # B 4.00
677 to 680.....	Common American # B 4.00
681 to 684.....	Common American # B 4.00
685 to 688.....	Common American # B 4.00
689 to 692.....	Common American # B 4.00
693 to 696.....	Common American # B 4.00
697 to 700.....	Common American # B 4.00
701 to 704.....	Common American # B 4.00
705 to 708.....	Common American # B 4.00
709 to 712.....	Common American # B 4.00
713 to 716.....	Common American # B 4.00
717 to 720.....	Common American # B 4.00
721 to 724.....	Common American # B 4.00
725 to 728.....	Common American # B 4.00
729 to 732.....	Common American # B 4.00
733 to 736.....	Common American # B 4.00
737 to 740.....	Common American # B 4.00
741 to 744.....	Common American # B 4.00
745 to 748.....	Common American # B 4.00
749 to 752.....	Common American # B 4.00
753 to 756.....	Common American # B 4.00
757 to 760.....	Common American # B 4.00
761 to 764.....	Common American # B 4.00
765 to 768.....	Common American # B 4.00
769 to 772.....	Common American # B 4.00
773 to 776.....	Common American # B 4.00
777 to 780.....	Common American # B 4.00
781 to 784.....	Common American # B 4.00
785 to 788.....	Common American # B 4.00
789 to 792.....	Common American # B 4.00
793 to 796.....	Common American # B 4.00
797 to 800.....	Common American # B 4.00
801 to 804.....	Common American # B 4.00
805 to 808.....	Common American # B 4.00
809 to 812.....	Common American # B 4.00
813 to 816.....	Common American # B 4.00
817 to 820.....	Common American # B 4.00
821 to 824.....	Common American # B 4.00
825 to 828.....	Common American # B 4.00
829 to 832.....	Common American # B 4.00
833 to 836.....	Common American # B 4.00
837 to 840.....	Common American # B 4.00
841 to 844.....	Common American # B 4.00
845 to 848.....	Common American # B 4.00
849 to 852.....	Common American # B 4.00
853 to 856.....	Common American # B 4.00
857 to 860.....	Common American # B 4.00
861 to 864.....	Common American # B 4.00
865 to 868.....	Common American # B 4.00
869 to 872.....	Common American # B 4.00
873 to 876.....	Common American # B 4.00
877 to 880.....	Common American # B 4.00
881 to 884.....	Common American # B 4.00
885 to 888.....	Common American # B 4.00
889 to 892.....	Common American # B 4.00
893 to 896.....	Common American # B 4.00
897 to 900.....	Common American # B 4.00
901 to 904.....	Common American # B 4.00
905 to 908.....	Common American # B 4.00
909 to 912.....	Common American # B 4.00
913 to 916.....	Common American # B 4.00
917 to 920.....	Common American # B 4.00
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925 to 928.....	Common American # B 4.00
929 to 932.....	Common American # B 4.00
933 to 936.....	Common American # B 4.00
937 to 940.....	Common American # B 4.00
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981 to 984.....	Common American # B 4.00
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989 to 992.....	Common American # B 4.00
993 to 996.....	Common American # B 4.00
997 to 1000.....	Common American # B 4.00

TUBING.

12 in. 10 5	Sheet 6c
14 all other size Sheets, 12 square foot.	
For turning both sides, double the above amount	
OF WEIGHT ENGLISHED COPPER.—Net.	
12 and 16oz. and heavier, 7 50c	By the case, 10 50c
14 and 16oz. and lighter, 6 50c	10 50c
16 7 in., 14 12 50c, 8 in., 14 60c, 6 in., 14 70c	
18 4 10c and heavier, 7 50c	By the case, 10 50c
(And all sizes not over 24 in. wide.)	
30 30 50c	
14 and 16 oz. and heavier, 10 50c	By the case, 10 50c
20 50c	

BRASS.

Brown & Sharp's Gauge the Standard for Metal; to Old English Gauge the Standard for Wire.

BRASS MANUFACTURERS' PRICE LIST. Dec. 1878.

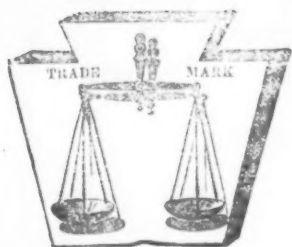
Cash prices for Roll and Sheet Brass. For less than quantity than 100 lbs. add 10c.

HIGH BRASS.

10 Not No. thinner than No. 24, wider than 2 in.,	
11 Not No. thinner than 1 in.	
12 Not No. thinner than 1 1/2 in. wider over 14 to	30c
13 Not No. inclusive, 1 1/2 in. wider over 14 to	35c
14 Not No. inclusive, 1 1/2 in. wider over 14 to	35c
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HENRY DISSTON & SONS

KEYSTONE SAW, TOOL,



STEEL and FILE WORKS,

FRONT AND LAUREL STS., Philadelphia.

BRANCH WORKS: Tacony, Pa.; Chicago, Ill.

We desire to call attention to the improvement in putting up our goods, substituting boxes for paper covering. This will prove a great advantage to the dealer, saving the time consumed in untying and tying, also keeping them in better condition.

The new style Box here shown is our latest. We have been putting up the No. 76 D-8 and No. 120 Saws in boxes containing one-third of a dozen.

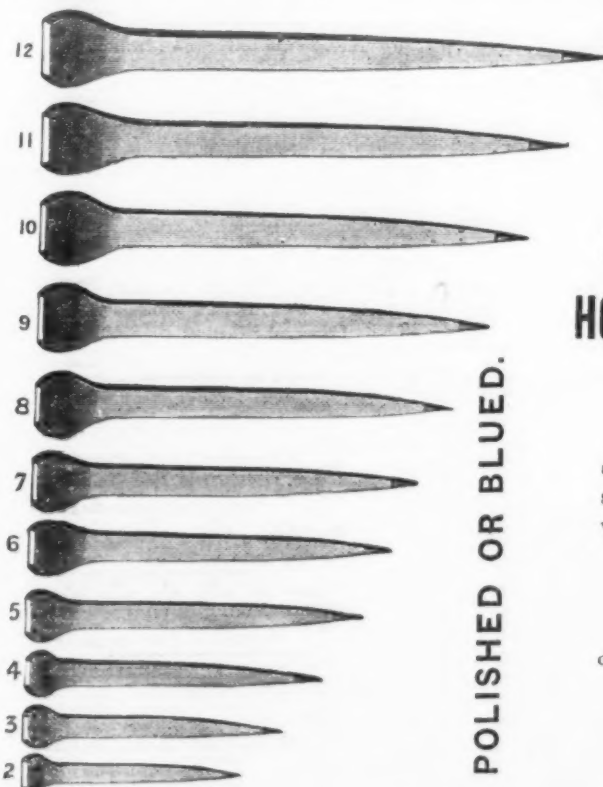


We have decided to put up all the saws marked "Disston" in this manner.

The boxes will contain $\frac{1}{3}$ dozen, and be assorted as follows: $\frac{1}{2}$, $\frac{3}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, which makes two of each size teeth in a box.

We will send all of the same size teeth in a box, if so ordered.

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AUSABLE HORSE NAILS,

Hot Forged and Cold Hammered Pointed,

Are the only Nails in market that are made in imitation of the Hand Process. They have the uniformity of Machine Nails and the toughness of those hammered by hand. Our

HOT FORGED AND COLD HAMMERED POINTED NAILS

Are the Standard Nails,

and are acknowledged to be the best in the market. They are used by the best shoers in New York, Brooklyn, Philadelphia, Chicago, Saint Louis, Milwaukee, Baltimore, &c., and

GENERALLY THROUGHOUT THE UNITED STATES.

They also compete successfully in Foreign Countries with machine and hand-made Nails of their own manufacture.

AUSABLE HORSE NAIL CO.,

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Twisted, Bent and Drawn COLD.



WM. H. HASKELL & CO.,
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MANUFACTURERS OF



COACH SCREWS

(With Gimlet Points),

ALL KINDS OF

Machine and Plow Bolts,
FORGED SET SCREWS,
AND
TAP BOLTS.



Bemis & Call Hardware & Tool Co.

PATENT COMBINATION WRENCH.

These Wrenches are made from the best of Wrought Iron, with Steel Head and Jaw, case-hardened throughout, and not only combine all of the superior qualities of our Cylinder or Gas Pipe Wrenches, but also all the requisite combinations of a regular Nut Wrench, thus making a combination which has no equal.

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BEMIS & CALL HARDWARE & TOOL CO., Springfield, Mass.

Iron and Brass Wood Screws.

We manufacture a full line of
IRON AND BRASS SCREWS.

Quality, finish and tests as to strength, guaranteed equal to any in the market. With improved facilities and largely increased capacity for production, we can fill orders promptly, and invite inquiries for discounts.

Philadelphia Screw Co., Limited,
Twelfth and Buttonwood Streets,
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PATENT SCREW WINDOW BALANCE

FOR MEDIUM AND LIGHT WINDOWS.

A Mechanical Substitute for Sash Weights.

Retains sashes at any point of opening, with large power in reserve, controlled by "Adjusting Screw." The fiber roller has unlimited durability. The patent "Clamp" prevents sagging. Cannot get out of order. THEY ARE TO WINDOWS WHAT DOOR KNOBS ARE TO DOORS, AND USERS SAY, A NECESSITY AND

"SURE OF GENERAL USE."

They are as readily applied as the common sash pulley, and have the merit of doing their work—rendering the use of boxed frames, cords, pulleys and the perplexing task of hanging sash with weights unnecessary. There is no cutting of, or attachment to, the sash; they work upon the edges of the sash only, and are not handled in working the sash. THE SASHES ARE BOTH LOCKED AND UNLOCKED BY A MEETING RAIL LOCK, as with weight, at one operation.

RETAIL PRICES.

12 to 18 lb. sashes, 4 balances, \$1.00 per window.
12 lb. sashes and under, 2 balances, 50 "

COMPARATIVE COST WITH WEIGHTS COMPLETE.

18 lb. sashes hung with weights, \$2.50 per window.
18 lb. " " with 4 balances applied, 1.25 "

Balances, saving, \$1.25 "
Sold in sets of 1 and $\frac{1}{2}$ gross packages. Sample sets, 4 balances, sent upon application for \$1.00, postage free. Have been in use over one year, giving full satisfaction.

LIBERAL DISCOUNT TO THE TRADE.

Prompt attention is given communication and orders addressed to

As Applied, **ROBERT B. HUGUNIN,**
Manufacturer of Screw Balances,
Wethersfield, Conn.

INFRINGEMENTS.—To whom it may concern:—As the inventor, patentee and solely authorized maker of the above goods under the mentioned U. S. Patents covering the combined inventions constituting the Screw Window Balance, and all other similar goods using these combined improvements being infringements of the said combined inventions, patented as before stated, all dealers, users, makers and handlers of such, are hereby notified that they will be held accountable, under the U. S. laws protecting inventions, for damages. Very respectfully,
WETHERSFIELD, CONN., April 25, 1879.
ROBERT B. HUGUNIN.



Penfield Block Works,

LOCKPORT, N. Y.,

Wrought Iron and Wood Shell

TACKLE BLOCKS.

All Steel Roller Bushings, and Roller Bushed Iron Heaves.

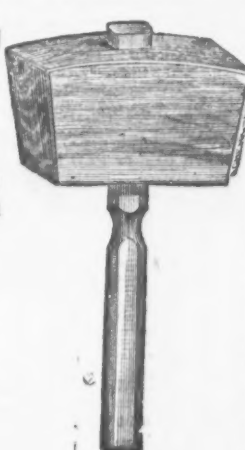
CARPENTER MALLETS

Of every description.

Giant Car Pusher and Faucets.



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MINES: Lehigh Valley, Pa. WORKS & FURNACES: Bergen Port, N. J.
The only Miners and Manufacturers of

PURE
LEHIGH SPELTER
From Lehigh Ore.

Especially adapted for

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Superior for LIQUID PAINT on account of its body and wearing properties.

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PUMPS

ERIE, PA.

ESTABLISHED, 1856

Warranted Genuine

Cucumber Pumps & Pumps. Also Pop

Pumps, Lined Pumps, &c.

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THE "EDDY" STRAIGHTWAY VALVES

ALSO,

FIRE HYDRANTS.

Axe, Hatchet, Powder a

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FOR ALL PURPOSES.

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SHEET COPPER.



SEAMLESS COPPER PUMP.

(Pat. July 9th, 1878.)

In addition to the great variety of Iron and Brass Pumps which we have been manufacturing for years, we are now making a full line of **COPPER PUMPS** under a patent granted July 9, 1878. The Barrel and Cone are drawn in one **SEAMLESS** piece. No brazing or soldering is required. Being made of heavy stock, they are stronger and more durable, give a perfect valve seat, and require less repairs than those made in the old manner. The Barrels are tested with a five hundred pound inside pressure to the square inch. The Spout also is seamless. Dealers and Plumbers pronounce them far superior to any fore in the market. The inside of the Pump and the working parts are thoroughly flamed, giving a healthy surface for the contact with water. The handle is convenient and nickel-plated. The Pumps are highly finished, neatly painted and decorated with gold bronze, the whole being a highly serviceable and ornamental article for a kitchen of the most costly residence. Discount to the trade, 25 per cent. Charge for Boxing. Freight paid to Boston or New York. Orders for all varieties of Pumps filled promptly. Please send for price list.

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Lain, Stamped & Japanned TIN WARE.

Block's Tin Spout Strainer & Patent O.K. Grater.




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Mofford's Patent Bit Brace.

Manufactured by
FRAY & PIGG,
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Iron, Four Sizes. Rosewood Head and Handle!

7... 7-inch sweep.	No. 10...	8-inch sweep.
8... 8 "	No. 108...	8 "
10... 10 "	No. 110...	10 "
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Pat. Mineral Wool.

A. D. ELLERS, 26 1/2 B'way, N. Y.

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Plain, Japanned, Bronzed, or Japanned with Plated Tips.

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We will be pleased to furnish estimates and take contracts for the manufacture of large lots of small machines, or articles made mostly of cast iron.

FACTORIES: **WAREHOUSE:**
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NICHOLS' SELF-ACTING ACID PUMP.

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The Old Way.



The New.

This is the most popular Coal Vase ever put upon the market.

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Eight Patterns

All New Styles

Please send for Illustrated Price Lists

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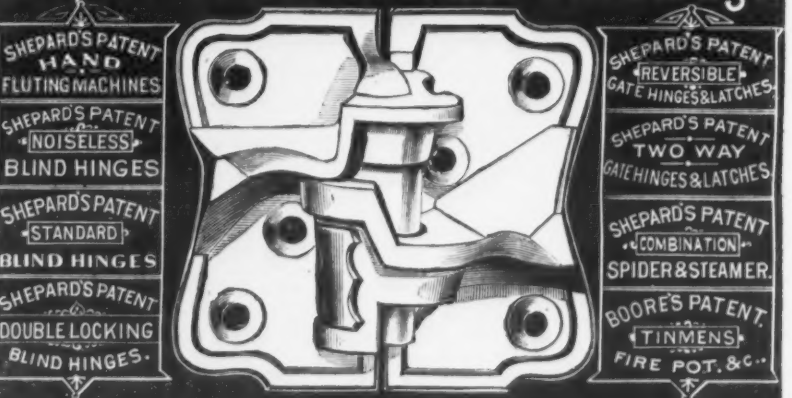
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The BEST and CHEAPEST in the world.



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OUR CELEBRATED BRANDS

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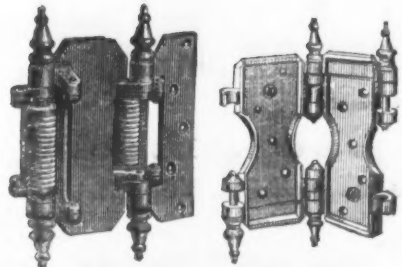
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THE COWLES HARDWARE COMPANY,

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Geer's Single and Double-Acting Spring Butts, which exert their greatest force at closing point.

Blank Butts, for inside doors. Cheapest in market.

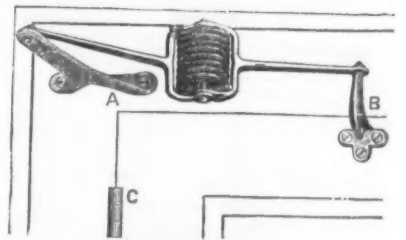
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Bullard's Carpet Stretcher,
Best thing ever offered for laying carpets.

MINCERS of all varieties; also, SCREW DRIVERS, Forged Blades;
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HERCULES
Reverse Action Door
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New principle, distinct from all others. Holds the door open as well as shut. Exerts its greatest force at the closing point. The best Spring in market.

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NEW YORK STATE AGRICULTURAL WORKS, Established 1830.



Jointed Pulverizing Harrow.



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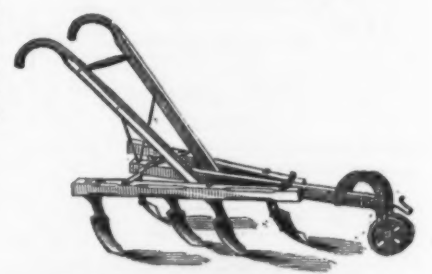
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WHEELER & MELICK COMPANY,

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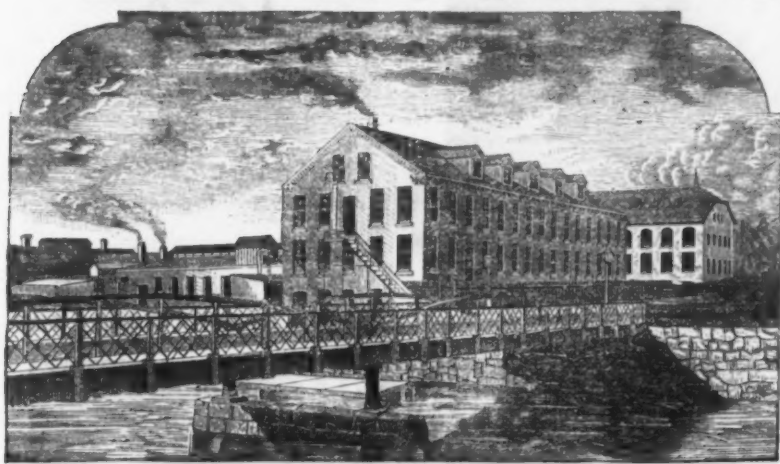


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EVERY PAIR WARRANTED.

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Cuts a round hole easily and quickly, and is made of such superior material that the blade does not become dull, as is the case with all round hole cutters introduced heretofore. The blade is readily adjusted to cut a circle from 2 1/2 to 3 1/2 inches in diameter.

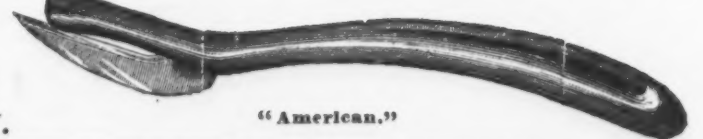
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The illustrations represent three different styles of Can Openers made by us. We desire to "close out" stock on hand and cease making. In lots of 10 gross and upward we will bill at very low prices.

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Iron Handle, "No. 5."



"American."



SCUTT'S PATENT FOUR-POINTED STEEL BARBED CABLE FENCE WIRE.

The cable is formed in the same manner as the great cables used in bridges, and has a tensile strength double that of any twisted wire. It is the only barbed wire so manufactured. Both wire and barb material are manufactured especially for our use from the finest grade of Siemens-Martin steel. Our wire offers double the protection afforded by any two-pointed barb, each rod giving 125 points, while two-pointed barbs give but 64. It is the most attractive in appearance, and the best selling wire in the market, and, by actual tests, the strongest, lightest and consequently the cheapest.

We manufacture under license from the Washburn & Moen Mfg. Co., and all danger of law suits is avoided in the purchase of our goods. We manufacture both painted and galvanized.

The only Solid Steel Four-pointed Barb. Send for circulars and price list.

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MANUFACTURERS OF

Horse, Mule & Snow Shoes of the Perkins Pattern.

Works at Valley Falls, R. I., and Buffalo, N. Y. Office, 31 Exchange Place, Providence, R. I.
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Adapted to every possible duty.

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PENNOCK'S

Patent Iron-Bender

Is one of the most valuable labor-saving tools that has ever been adopted by Car Builders or Machinists. They are used by many of the largest Railroad Companies and Car Builders in the country. Send for circular.

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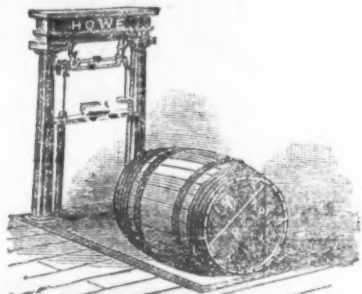
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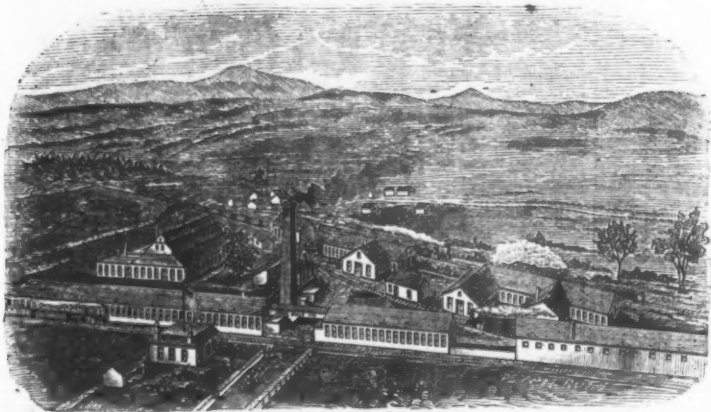
Agent for CLEMENT & MAYNARD'S Trowels, Hoes, Shovels, Spades and Scoops. Their Trowels and Hoes have entirely supplanted the English by their quality and cheapness. While all their goods compare advantageously with those of other makers, and are largely exported.

THE IMPROVED HOWE SCALES.

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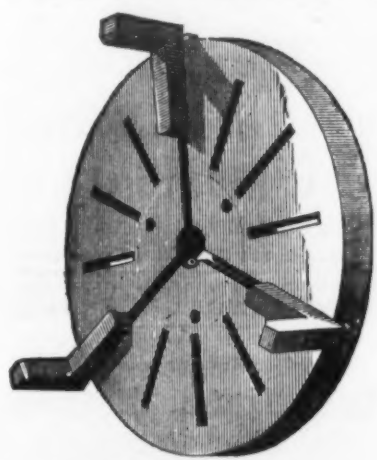
Standard.

The highest Awards have invariably been given the Improved Howe Scales wherever exhibited in competition with other makes.

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Front View.

THE HORTON CAR WHEEL CHUCK.

This Chuck can be attached to a boring machine table, or lathe, and will hold a car wheel 37 inches in diameter and less. The jaws are made long to fit both tread and flange of car wheels, thus truing them both ways. For general machine work it is very useful, and will hold firmly any work that can be held in a Chuck.

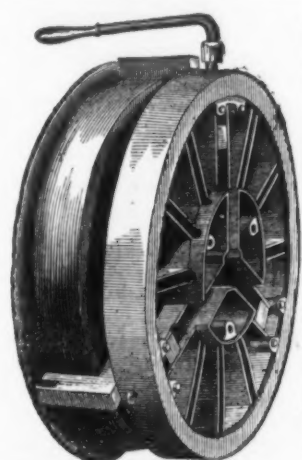
THE E. HORTON & SON CO.,

MANUFACTURERS OF

THE HORTON

LATHE CHUCK

Windsor Locks, Conn., U. S. A.



Back View.

THE HORTON CAR WHEEL CHUCK.

This cut represents the Horton Car Wheel Chuck holding a car wheel in proper position for boring, the flange and tread of the wheel assuming a true position on the jaws. For accuracy and ease of operation this Chuck has no equal.

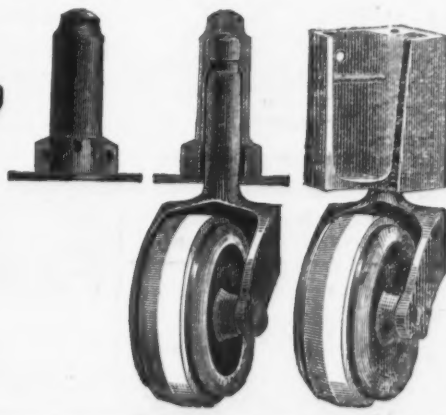
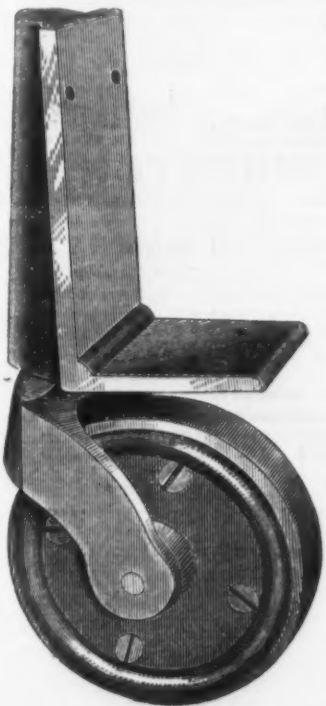
WHEELS AND CASTERS A SPECIALTY.

All who have used these Wheels on concrete, inlaid or wood floors say they cannot do without them. They will save double their extra expense in mills, warehouses, steamboats; in fact, almost every place where Wheels are used. My Caster Wheels are the best ever offered to the public for good furniture, as they will not mar the finest inlaid floor or soil the most delicate carpet ever used.

Send for catalogue and price list.

Address,

G. P. CLARK, Windsor Locks, Conn.



THE HARTFORD MACHINE SCREW CO.,

MANUFACTURERS OF

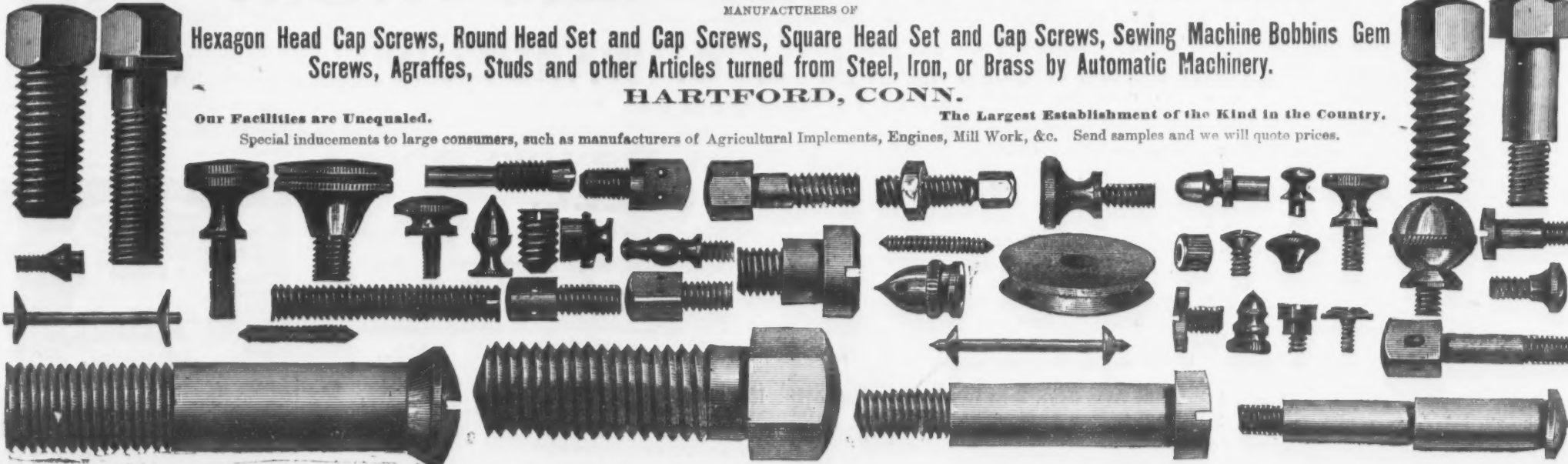
Hexagon Head Cap Screws, Round Head Set and Cap Screws, Square Head Set and Cap Screws, Sewing Machine Bobbins Gem Screws, Agraffes, Studs and other Articles turned from Steel, Iron, or Brass by Automatic Machinery.

HARTFORD, CONN.

Our Facilities are Unequaled.

Special inducements to large consumers, such as manufacturers of Agricultural Implements, Engines, Mill Work, &c. Send samples and we will quote prices.

The Largest Establishment of the Kind in the Country.



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WOLFF, KAHN & CO.,

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R. H. WOLFF & CO.,MANUFACTURERS, IMPORTERS, EXPORTERS & GENERAL MERCHANTS
MANUFACTURERS OFCAST STEEL WIRE for all Purposes, Special Wire,
Market Steel Wire, Prime Coppered
Spring Wire, and of all Kinds of
Furniture Springs, &c.

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**IRON & STEEL, WIRE RODS,
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Successor to JOSHUA MOSS and GAMBLE BROS.

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Hammers, Anvils, Vises, Blacksmiths' Tools.

WARRANTED CAST STEEL. Specially adapted for Dies, Punches,
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ALSO, THE WORLD-RENOVED

IMPROVED MILD CENTERED CAST STEEL.
Specially adapted for Taps, Reamers, Milling Tools, &c. Warranted
not to crack in hardening Tools of any size.SHEET, GERMAN, MACHINERY, SPRING AND EVERY OTHER DESCRIPTION OF STEEL.
Phila.—J. S. Watson & Son, Agents, 512 Commerce St.,
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CRESCENT STEEL,

In Bars, Sheets, Cold-Rolled Strips, &c.

Polished, Compressed Drill Rods and Wire,

Warranted equal to any imported in quality, finish and accuracy.

Also Common Grades.

Established 1810.

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Manufacturers of the "Celebrated

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Also of Superior

STEEL

For Drills, Cold Chisels, Tools, Taps, Dies, &c.

COLD ROLLED STEEL for Clock Springs, Corsets, &c.

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GERMAN, MACHINERY, ENGLISH AND SWEDISH SPRING STEEL,
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Siding of Siemens-Martin, Bessemer Steel and Iron.made from our own Lake Superior Ores.
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BEST REFINED CAST STEEL

And grades of Steel specially adapted for Lathes Tools, Chisels and Taps and Dies.

Warranted most superior for TOOLS AND GRANITE ROCK DRILLS.

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Also Springs, Axles, Rake Teeth, &c.

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MANUFACTURERS OF

Bessemer Railway Steel,

MERCHANT BARS, TIRE AND SHAFTING.

Railroad Iron, Pig Iron, Merchant and Ship Iron,

AGENCIES IN BOSTON AND PHILADELPHIA.

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CHAS. DOUGLASS, Gen'l Supt.

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piece of iron solidly welded to the steel with the use of sand only, and the other end
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be made by any blacksmith from our Toe Calk Steel, or seen at

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Sole Manufact'rs of **"CHOICE"** Extra Cast Steel.

Manufacturers of all Descriptions of Steel.

Manufacturers of Every Kind of Steel Wire.

Don Works, Sheffield, England.

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S. & C. WARDLOW,

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Manufacturers of the Celebrated

**Cast and Double Shear
STEEL.**In Bars, Sheets and Coils, for fine Pen and Pocket Cutlery, Table Knives,
Mining Tools, Dies, Files, Clock and other Springs, and Tools of every variety.

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FOREST CITY STEEL CO.,

Manufacturers of Best Quality

Crucible Steel for Drills, Taps, Dies, Tools, Mill Picks, &c.

Testimonial of D. J. Jones, Roll Turner, Cleveland Rolling Mill Co.

"I have been testing the steel on chilled iron rolls along with the best English and American steels,
and find it superior to any of them in every respect."

Samples furnished for trial. Quality guaranteed equal to any.

No. 13 Detroit Street, Cleveland, Ohio.

Steel.

**R. MUSHET'S
Special Steel**

FOR

LATHES, PLANERS, &c.Turns out at least double work by increased speed
and less waste of material than any other
Steel. Neither hardening nor tempering required.

Sole Makers,

SAMUEL OSBORN & CO.,
Sheffield, England.

Represented in the United States by

RANDALL & JONES,

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STEELINE.Used for refining and temper-
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Increases their durability at
least fivefold.Secures absolute safety from
cracking.

Send for circular to

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Emery, Grindstones, &c.**Walter R. Wood,
GRINDSTONES.**

Berea, O., Nova Scotia, & other brands

283 and 285 Front Street, New York.

WORTHINGTON & SONS.

North Amherst, Ohio.

Manufacturers of

**Lake Huron Amherst
and Berea****GRINDSTONES.****BOYD & CHASE,**

The largest manufacturers in the world of

OIL STONE

Of all description.

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Manufacturers of

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Black River, O., Wickesley, Eng.,
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33 West and 58 Washington Sts., N. Y.

ASHLAND EMERY CO.

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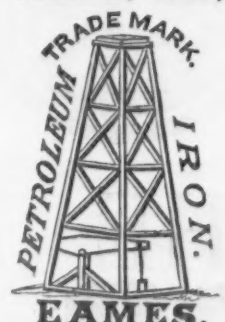
A. A. IRVINE & CO., Agents,

14 Murray St., New York.

Send for quotations and samples.

EAMES' OIL FUEL PROCESS CO.**EAMES'****PETROLEUM IRON WORKS,**

Titusville, Penn.,



Manufacturers of

Petroleum Iron Blooms.These Blooms are made from selected wrought
scrap with petroleum fuel; can be used for mak-
ing crucible steel, tack plate, horse shoes, boiler
flange iron, &c., or for any purpose requiring a
neutral, tough and uniform iron.

Steel.
THE EDGAR THOMSON STEEL CO.,
LIMITED.

MANUFACTURERS OF



General Office and Works at Bessemer Station (Penn. R. R.), Allegheny County, Pa.

New York Office, 57 Broadway.

The Company warrants its rails equal in quality to any manufactured in the United States.

Branch Office and P. O. Address, No. 48 Fifth Ave., Pittsburgh, Pa.
THOS. M. CARNEGIE, Chairman. D. A. STEWART, Sec'y and Treas.

JOHN WILSON'S CELEBRATED



GRANTED A D 1768 BY THE CORPORATION OF CUTLERS OF SHEFFIELD AND PROTECTED BY ACT OF PARLIAMENT.

REGISTERED ALSO AT WASHINGTON U.S.A. ACCORDING TO ACT OF CONGRESS

ALSO AT LEIPZIG, IN ACCORDANCE WITH THE GERMAN TRADE MARKS REGISTRATION ACT.

**BUTCHERS' KNIVES,
BUTCHERS' STEELS,
AND
SHOE KNIVES.**

It having come to the knowledge of JOHN WILSON that Counterfeit Butchers' Knives, purporting to be of his manufacture, are being sold in the United States, he hereby cautions all purchasers of his Knives and Steels to be on the alert against such imposture.

JOHN WILSON also hereby gives Notice, that it is his determination to institute Legal Proceedings against any person or persons who may be detected infringing his Trade Mark.

Every article of JOHN WILSON'S manufacture, bears the Trade Mark, in addition to the Name.

WORKS—SYCAMORE ST., SHEFFIELD, ENGLAND. Established 1750.

North Chicago Rolling Mill Co.

ESTABLISHED 1857. CAPITAL, \$3,000,000. INCORPORATED 1866.

Works at Chicago, Ill., and Milwaukee, Wis.

MANUFACTURERS OF

**MERCHANT BAR, FISH PLATES, PIG METAL,
IRON RAILS & BESSEMER STEEL RAILS.**

CAPACITY OF WORKS.	
Fish Plates.....	25,000 tons.
Merchant Bar.....	20,000 "
Pig Metal.....	20,000 "
Iron Rails.....	20,000 "
Steel Rails.....	20,000 "
Total Capacity per year.....	100,000 "

OFFICES:

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37 Mitchell Block, Milwaukee, Wis.

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S. P. BURT, Vice-President, NEW BEDFORD.
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THE STEEL COMPANY OF SCOTLAND, LIMITED,
(SIEMENS' PROCESS.)

MANUFACTURERS OF

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Steel Blooms for Rails, Steel Boiler Plates,
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Steel Wire Rods, Steel Forgings,
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JAMES LEE & CO.,

Resident Agents for the United States,
72 Pine Street, New York.

PYROLUSITE MANGANESE COMPANY,

MINERS, DEALERS AND EXPORTERS OF HIGH TEST

Crystallized Black Oxide of

Manganese

IN CRUDE STATE.

Suitable for the manufacture of Ferro-Manganese, Spiegeleisen, Bessemer Pig, &c. Also, fine ground and granulated, especially prepared for

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Office, 54 Cliff Street, New York.

Philadelphia Smelting Co.,

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GENUINE BABBITT,

Guaranteed at a speed of 10,000 a minute, and at any pressure for 10 years.

DEOXIDIZED BRONZE,

Superior to Phosphor Bronze or any other alloy of Copper and Tin for Machinery Journals.

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"Deoxidized Bronze" as journal boxes in our rolling mill, where great pressure is required, we take pleasure in recommending it as being superior to any we have heretofore used.

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R. D. WYNN,

Windsor, Vt., U. S. A.,

Sole manufacturer of the above Screw. Indorsed by builders, railroad and mining men as the best screw jack in the market. Also manufactures Press Screws, Lard and Wine Presses, Tackle Blocks, &c. Circulars and prices, address as above. (Please say *The Iron Age*.)

Agents: Pugsley & Chapman, 4 Liberty St., New York.
Sam'l May & Co., 15, 18 & 20 Oliver St., Boston.

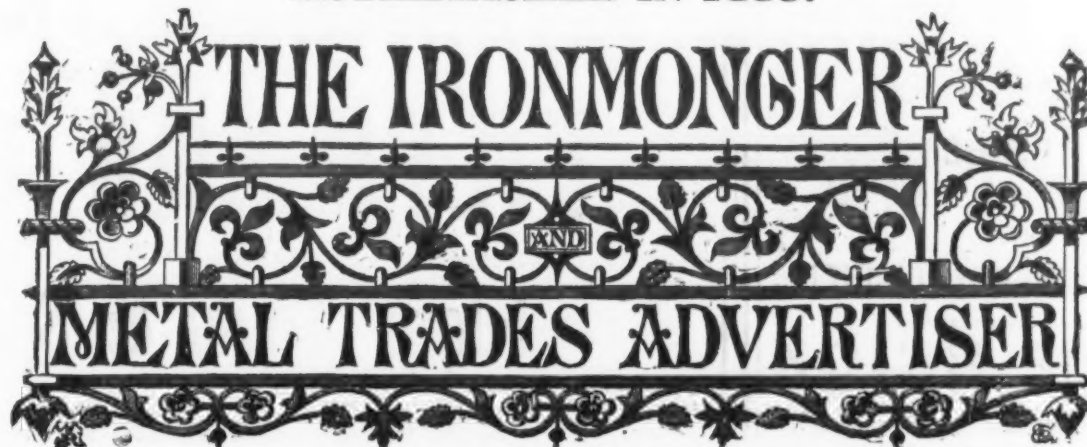


WIRE NAILS

French Points, Window Shade Nails,
Upholstering, **WAGON NAILS**, Molding Nails
(Sample Cards sent on application.)
Electrotype, Roofing Nails,
Barbed Caster Nails.

Vener Nails, Label Tacks and small Nails of all kinds, Cabinet Nails, Barbed Lock Nails, Cigar Box Nails, &c., &c., put up in bulk, 5 lb. package, 1 lb. papers, or as wanted.
AMERICAN WIRE NAIL CO.
Factory, Fifteenth and Madison Sts. COVINGTON, KY.

ESTABLISHED IN 1859.



PUBLISHED EVERY SATURDAY.

THE OLDEST AND CHIEF REPRESENTATIVE OF THE IRON, HARDWARE AND METAL TRADES.

OFFICE: 44a CANNON STREET, LONDON, E. C.

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Notes of Novelties.—This is a department of the journal always watched with interest by the trade, as it contains an account, from week to week, of the novelties which manufacturers and inventors are introducing to the notice of the trade. These articles are freely illustrated. **Special Correspondents.**—The *Ironmonger* has a deserved reputation for its special correspondence from all the principal Continental, British and manufacturing centers. The writers are gentlemen holding important positions in the districts with which they are connected, and possess facilities for acquiring information specially suited for the columns of the *Ironmonger*. **The Week, Legal News, Trade Notes, Bankruptcies, Foreign Notes, Colonial Statistics, Merchants' Circulars, Imports and Exports, &c.** are each departments of the journal, containing a digest of all matters of direct interest to the Iron, Hardware and Metal Trades. In addition to the above, there is a carefully classified list of Patents, together with Editorial Notes, French, Belgian and other Special Correspondence.

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to the *Ironmonger* and *Metal Trades Advertiser*, with which is sent every fourth week the Foreign Supplement (see below), may commence from any date, but are not received for less than a year complete. The rate is \$5 per annum, inclusive of postage to any part of the world outside Great Britain. To every subscriber is presented, free, in the course of his year, a handsome and useful *Ironmongers' Diary and Text Book*, a work sold to non-subscribers at 75 cents.

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This is an annual, presented free to every Subscriber to the *IRONMONGER AND METAL TRADES ADVERTISER*. It contains a large number of ruled skeleton pages for diary and other entries, and in addition much useful reference information, varied from year to year. It is handsomely bound in cloth, gilt, and as copies are used in thousands of establishments for a whole year, it is obviously a medium of exceptional value for advertisements. Sold to non-subscribers at 75 cents.

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Is published every fourth week in connection with the extensive and world-wide circulation of the *Ironmonger* itself. The dates of its publication in 1890 will be as follows: JANUARY 11; FEBRUARY 8; MARCH 8; APRIL 5; MAY 3 and 31; JUNE 28; JULY 26; AUGUST 23; SEPTEMBER 20; OCTOBER 18; NOVEMBER 15; DECEMBER 13.

This Supplement is published in

FIVE LEADING COMMERCIAL LANGUAGES

of the world, including English, and is sent to all the countries where they are spoken, thus placing the contents of the *Ironmonger* not only within reach out in the native language of eighty millions of German, forty-two millions of French, twenty-eight millions of Italian, and fifty-one millions of Spanish speaking people; or, in all, over two hundred millions of inhabitants in the principal nations where the best purchasers of manufactured goods are to be found.

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THE WHOLE FOREIGN HARDWARE TRADE,

so far as a 12 experience of twenty years is concerned, will be covered by THE FOREIGN SUPPLEMENT at least twice a year. Thus a Price List or Advertisement inserted in the *Ironmonger* and FOREIGN SUPPLEMENT is a strikingly powerful and most efficient way of publicity not to be compared with any other ordinary channels of communication.

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BEST AND CHEAPEST.
Established 1845.
Office foot of Houston Street, East River,
NEW YORK.

NEWTON & CO.,

ALBANY, N. Y., Manufacturers of

FIRE BRICK

Stove Linings,

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Cylinder Brick, &c., &c.

M. D. Valentine & Bro

Manufacturers of

FIRE BRICK

And Furnace Blocks
DRAIN PIPE & LAND TILE.

Woodbridge, - - - N. J.

BORGNER & O'BRIEN,

Manufacturers of

FIRE BRICK

Edge Pressed Furnace Blocks,
CLAY RETORTS, TILES, &c.,
Twenty-third Street,
K 2076 Race, PHILADELPHIA.
Twenty years' practical Experience.

PERTH AMBOY TERRA COTTA CO.,

Successors to

A. HALL & SONS, Perth Amboy, N. J.,
ARCHITECTURAL TERRA COTTA

FIRE BRICK.

170 Broadway, NEW YORK.

Brooklyn Clay Retort

FIRE BRICK WORKS.

Manufacturers of Clay Retorts, Fire Bricks, Gas
House and other Tile, Cupola Brick, &c. Dealers in
and Miners of Fire Clay and Fire Sand. Clay bank at
Burr's Creek, New Jersey. Manufacture: Van Dyke,
Elizabeth, Richards and Partition Sts., Brooklyn, N. Y.
Office No. 88 Van Dyke St.

Watson Fire Brick Manufactory

ESTABLISHED 1836.

JOHN B. WATSON, Perth Amboy, New Jersey.
Manufacturer of

FIRE BRICK,

For Rolling Mills, Blast Furnaces, Foundries,
Gas Works, Lime Kilns, Tanneries, Boiler
and Grate Setting, Glass Works, &c.
FIRE CLAYS, FIRE SAND, AND KAOLIN FOR SALE.

HENRY MAURER,

Proprietor of the

Excelsior Fire Brick & Clay

Retort Works,

Manufacturer of FIRE BRICK, HOLLOW
BRICK AND CLAY RETORTS.

WORKS PERTH AMBOY, NEW JERSEY
Office & Depot: 418 to 422 East 23d St., N. Y.

TROY FIRE BRICK WORKS

Troy, N. Y.,

JAMES OSTRANDER & SON,

ESTABLISHED 1845,
Manufacturers of

FIRE BRICK,

Furnaces, Tiles, Blast Furnace Blocks, etc. Miners and
Dealers in Woodbridge Fire Clay and Sand, and Staten
Island Kaolin.

Established 1864.

GARDNER BROTHERS,

MANUFACTURERS OF

STANDARD SAVAGE

Fire Brick, Tile & Furnace Blocks,
OF ALL SHAPES AND SIZES.

Clay Gas Retorts and Retort Settings,
AND

Miners and Shippers of Fire Clay.

OFFICE: 376 Penn Ave., Pittsburgh, Pa.
WORKS: Mt. Savage Junction, Md., and Lockport, Pa.

HALL & SONS,

FIRE BRICK,

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(Established 1844).

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And Brickmakers' Tools in General.

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Manufacturers of

Brass, Galvanized & Ship
Chandlery Hardware,

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DUK'S IMPROVED ELEVATOR BUCKET.



THE STORE-HOUSE BUCKET.
(Partial straight front.)
In 12 in., 14 in., 16 in. and 17 in. Sizes.

Made of Best Charcoal Stamping Iron.
No Corners to Catch.
Light Running and Very Durable.
The only Scientifically Constructed Elevator Bucket
in the Market.

T. F. ROWLAND,

Sole Manufacturer,

CONTINENTAL WORKS, Brooklyn, E. D., N. Y.

Send for Circular.



THE
MILL BUCKET.
In 3 1/2 in. to 10 in.
Sizes.

NICHOLSON FILE CO., FILES AND RASPS.

Manufacturers of

Filers' Tools & Specialties.

Manufactory and Offices at Providence, R. I.

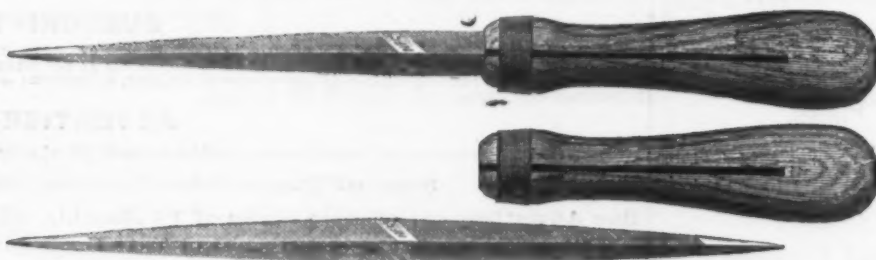
The following space will be used in illustrating our specialties, the matter being changed weekly.

(Trade Mark.)

"DOUBLE ENDER"

HAND-SAW FILE AND HANDLE.

Patented January 1st, 1878.



The above illustrations represent a new pattern of handsaw file and handle ;
also the two combined as when ready for use.

We have for a long time felt that a file so universally used as the handsaw
file, could be presented to the public in a form that would more perfectly adapt
it to their wants, and that, at the same time, it should be accompanied with a
cheap and convenient form of handle, which could be instantly affixed.

Our Double Enders meet both these ideas, and cannot, we think, fail to com-
mend themselves to all classes in the community who will give them a trial.

They are neatly put up in boxes containing six Double Enders and six Han-
dles, and designated as follows:

No. 7, Double Ender, single cut—represents two 3 1/2 in. Taper Saw Files.
No. 8, " " " " " " " 4 " " "
No. 9, " " " " " " " 4 1/2 " " "
No. 10, " " " " " " " 5 " " "

Every parcel will be labeled and every handle stamped with the words "Double
Ender," which we have secured as our *Trade Mark*, and by which this class of
goods will be known.

Its genuine merit, as a simple and useful combination, is as apparent as its
economy, and combined, they render it so desirable an article for the consumer as
to at once command the favorable attention of the dealer.

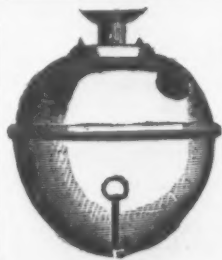
G. W. Bradley's Edge Tools.

Butchers' Cleavers,
Butchers' Choppers,
Axes and Hatchets,
Grub Hoes and Mattocks,
Mill Picks,
Box Chisels and Scrapers,

Ring Bush Hooks,
Ax Eye Bush Hooks,
Socket Bush Hooks,
Watt's Ship Carpenters' Tools,
Carpenters' Drawing Knives,
Coopers' and Turpentine Tools.

FOR SALE BY

MARTIN DOSCHER, Agent, 96 Chambers Street, N. Y.



Established 1838.
Bevin Bros. Mfg.
Co.,

Easthampton, Ct
Manufacturers of
SLEIGH BELLS

House, Tea, Hand,
Gong Bell &c.
Bell Metal Kettles.

John T. Lewis & Bros
No. 231 South Front St.,
PHILADELPHIA.



TRADE MARK.

MANUFACTURERS OF

Pure White Lead, Red Lead, Litharge,
Orange Mineral, Linseed Oil,
AND PAINTERS' COLORS

Brooklyn White Lead Co.



TRADE MARK.

White Lead, Red Lead & Litharge.
89 Malden Lane, NEW YORK.
FISHER HOWE, TREASURER.

JOHN JEWETT & SONS

Manufacturers of the well-known brand of

WHITE LEAD.



TRADE MARK.

ALSO MANUFACTURERS OF

LINSEED OIL.

182 Front Street, NEW YORK.



TRADE MARK.

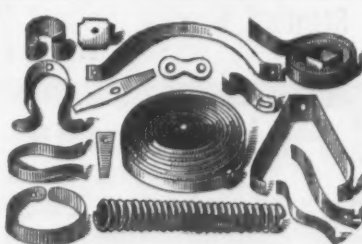
The Atlantic White Lead and Linseed Oil Co.,

MANUFACTURERS OF

White Lead (Atlantic), Red Lead,
Litharge & Linseed Oil.

ROBERT COLGATE & CO.,

287 Pearl Street, New York



DUNBAR BROS.,

Manufacturers of

Clock Springs and Small Springs

of every description, from best Cast Steel,

BRISTOL, CONN.

Torrey's Door Springs.

P. R. DUNNE,

Manufacturer,



182 Fulton St.,
NEW YORK.

ORGANS

33 Stops, 3 set Reeds, Stool, Book,
Bells, 48 ft. Flange, Stool, Cover &
Book only \$12.75. Paper Case,
D. F. BRATTY, Washington, N. J.

PHILADELPHIA.

(Corrected Weekly by Lloyd, Supplee & Walton.)
Terms, 30 days. For 60 or 90 days, interest added at 10 per cent. per annum.

Amvils.
Peter Wrights, # 2.....10 1/2 net
Over 250 lbs.....11 c net
Eagle (American).....10 1/2 net

Apple Papers.
Reading No. 72.....per doz \$5.00 net
No. 74.....6.00 net
No. 76.....7.00 net
No. 78.....7.50 net
Peach Papers.....15.00 net
Little Favorites, cover and silver.....7.50 net
Lots of 10 to 25 dozen special price.

Axes.
Hann's Red Warrior.....per doz \$5.00 net
Red Indian.....9.00 net
Red Chieftain, bevelled.....9.00 net
Crown Prince.....9.50 net

Augers and Auger Bits.
Bates Nut Augers.....dis 40 1/2
Cook's Augers.....dis 40 1/2
Watrous Ship Augers.....dis 15 1/2
Benjamin Pierce Auger Bits.....dis 30 1/2
Graham Auger Bits.....dis 40 1/2
Cook's.....dis 40 1/2
Jennings.....dis 10 1/2
Bonney's Pat. Hol. Augers, list \$4 1/2 per doz.....dis 25 1/2
Stearns' Pat. Hol. Augers, list \$4 1/2 per doz.....dis 25 1/2

Balances.
Light and Common.....dis 20 1/2

Bells.
Berlin Bros. Mfg. Co. Light Hand Bells.....dis 70 1/2
Swiss Pattern Hand Bells.....dis 70 1/2
Connell's Door Bells.....dis 35 1/2
Ut. Western & Kentucky Cow, new list.....dis 50 1/2

Belt and Rivet.
Chambers' No. 1 for 1/2 bolt.....each \$7.50
No. 2.....9.00
No. 3.....12.00

Boring Machines.
Upright, with Augers.....List \$6.50 dis 40 1/2
without Augers.....5.00 dis 40 1/2
Angular, with Augers.....10.00 dis 40 1/2
without Augers.....6.75 dis 40 1/2

Bolts.
Eastern Carriage Bolts.....dis 70 1/2
Philadelphia.....new list dis 60 1/2
Stanley Wrought Shutter.....dis 50

Braces.
Barber's.....dis 40 1/2
Backus.....dis 50 1/2
Spofford.....dis 50 1/2
American Ball.....dis 50 1/2

Butts.
Cast Fast Joint, Narrow.....dis 40 1/2
Broad.....dis 40 1/2
Cast Loose Joint, Narrow.....dis 40 1/2
Broad.....dis 40 1/2
Acorn, Loose Pin.....dis 50 1/2
Mayer's Loose Joint.....dis 50 1/2
Wrought Loose Pin.....dis 50 1/2
Table Hinges and Back Flaps.....dis 40 1/2
Narrow, Fast.....dis 40 1/2
Loose Joint.....dis 50 1/2

Blind Butts.
Parker.....dis 50 1/2
Clark.....dis 50 1/2
Shapard.....dis 50 1/2
Lull & Porter.....dis 50 1/2
Huffer's.....dis 40 1/2

Chains.
German Halter and Coll. new list Oct. 27.....dis 10 1/2
Galvanized Pump.....dis 10 1/2
Best Proof Coll Chain—English.....dis 10 1/2
3 to 4.....dis 10 1/2
4 to 5.....dis 10 1/2
5 to 6.....dis 10 1/2
6 to 7.....dis 10 1/2
7 to 8.....dis 10 1/2
8 to 9.....dis 10 1/2
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95 to 96.....dis 10 1/2
96 to 97.....dis 10 1/2
97 to 98.....dis 10 1/2
98 to 99.....dis 10 1/2
99 to 100.....dis 10 1/2

Chambers' No. 1 for 1/2 bolt.....each \$7.50

Chambers' No. 2.....9.00

Chambers' No. 3.....12.00

Chambers' No. 4.....15.00

Chambers' No. 5.....18.00

Chambers' No. 6.....21.00

Chambers' No. 7.....24.00

Chambers' No. 8.....27.00

Chambers' No. 9.....30.00

Chambers' No. 10.....33.00

Chambers' No. 11.....36.00

Chambers' No. 12.....39.00

Chambers' No. 13.....42.00

Chambers' No. 14.....45.00

Chambers' No. 15.....48.00

Chambers' No. 16.....51.00

Chambers' No. 17.....54.00

Chambers' No. 18.....57.00

Chambers' No. 19.....60.00

Chambers' No. 20.....63.00

Chambers' No. 21.....66.00

Chambers' No. 22.....69.00

Chambers' No. 23.....72.00

Chambers' No. 24.....75.00

Chambers' No. 25.....78.00

Chambers' No. 26.....81.00

Chambers' No. 27.....84.00

Chambers' No. 28.....87.00

Chambers' No. 29.....90.00

Chambers' No. 30.....93.00

Chambers' No. 31.....96.00

Chambers' No. 32.....99.00

Chambers' No. 33.....102.00

Chambers' No. 34.....105.00

Chambers' No. 35.....108.00

Chambers' No. 36.....111.00

Chambers' No. 37.....114.00

Chambers' No. 38.....117.00

Chambers' No. 39.....120.00

Chambers' No. 40.....123.00

Chambers' No. 41.....126.00

Chambers' No. 42.....129.00

Chambers' No. 43.....132.00

Chambers' No. 44.....135.00

Chambers' No. 45.....138.00

Spoons.
Plated.....dis 40 1/2
German Silver.....dis 50 1/2
Britannia Boardman's.....dis 55 1/2
Parker's.....dis 55 1/2

Tinned.
Philadelphia.....dis 40 1/2
Chattfield No. 1.....dis 40 1/2
Gem Coll No. 1.....dis 40 1/2
No. 2.....dis 40 1/2
No. 3.....dis 40 1/2
No. 4.....dis 40 1/2
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No. 96.....dis 40 1/2
No. 97.....dis 40 1/2
No. 98.....dis 40 1/2
No. 99.....dis 40 1/2
No. 100.....dis 40 1/2

Stocks and Dies.
Sears Polish.....dis 10 1/2
Dixon.....dis 10 1/2
Onyx.....dis 10 1/2
Double Pointed Tacks.....dis 40 1/2

Tacks, Brads, &c.
Shoe Nails.....dis 40 1/2
Double Pointed Tacks.....dis 40 1/2

Traps.
Genuine Oneida—Newhouse.....dis 30 1/2
In. Oneida—Newhouse list.....dis 40 1/2

Vices.
Solid Box, Trenton new list.....dis 35 1/2
Wrenches—Agricultural.....dis 65 1/2
Coss Genuine.....dis 55 1/2
Mechanical.....dis 55 1/2
Mail Bar.....dis 70 1/2
Philada. Tool Co., Duplex.....dis 25 1/2

Wire.
Brist or Ann'd, No. 10 to 18.....dis 45 1/2
No. 19 to 25.....dis 55 1/2
No. 26 to 35.....dis 65 1/2
Coppered, 6 to 18.....dis 45 1/2
Tinned Broom Wire.....dis 45 1/2
Galvanized, No. 7 to 15.....dis 35 1/2

Wringers.
Novelty No. 10.....dis 50 1/2
Novelty No. 2.....dis 50 1/2
Universal No. 24.....dis 50 1/2
Peerless, No. 24.....dis 50 1/2
No. 2.....dis 50 1/2

PITTSBURGH.

Merchant Iron.

Terms.—Note or acceptance at 60 days, with current rate of exchange on New York, or a discount of 2 per cent. for cash, if remitted within 10 days from date of invoice.

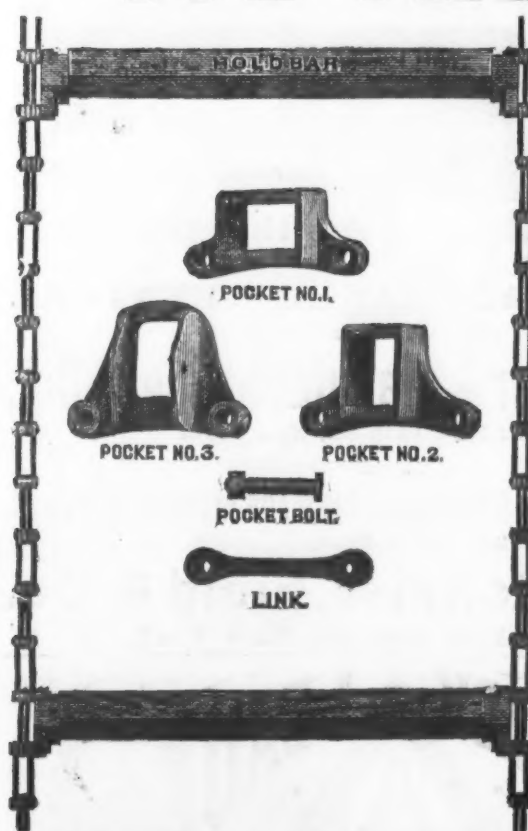
Flat Bar.
1 1/2 to 4 by 1/2 to 1 inch.....3.00
4 to 6 by 1/2 to 1 inch.....3.10
6 to 8 by 1/2 to 1 inch.....3.20
8 to 10 by 1/2 to 1 inch.....3.30
10 to 12 by 1/2 to 1 inch.....3.40
12 to 14 by 1/2 to 1 inch.....3.50
14 to 16 by 1/2 to 1 inch.....3.60
16 to 18 by 1/2 to 1 inch.....3.70
18 to 20 by 1/2 to 1 inch.....3.80
20 to 22 by 1/2 to 1 inch.....3.90
22 to 24 by 1/2 to 1 inch.....4.00
24 to 26 by 1/2 to 1 inch.....4.10
26 to 28 by 1/2 to 1 inch.....4.20
28 to 30 by 1/2 to 1 inch.....4.30
30 to 32 by 1/2 to 1 inch.....4.40
32 to 34 by 1/2 to 1 inch.....4.50
34 to 36 by 1/2 to 1 inch.....4.60
36 to 38 by 1/2 to 1 inch.....4.70
38 to 40 by 1/2 to 1 inch.....4.80
40 to 42 by 1/2 to 1 inch.....4.90
42 to 44 by 1/2 to 1 inch.....5.00
44 to 46 by 1/2 to 1 inch.....5.10
46 to 48 by 1/2 to 1 inch.....5.20
48 to 50 by 1/2 to 1 inch.....5.30
50 to 52 by 1/2 to 1 inch.....5.40
52 to 54 by 1/2 to 1 inch.....5.50
54 to 56 by 1/2 to 1 inch.....5.60
56 to 58 by 1/2 to 1 inch.....5.70
58 to 60 by 1/2 to 1 inch.....5.80
60 to 62 by 1/2 to 1 inch.....5.90
62 to 64 by 1/2 to 1 inch.....6.00
64 to 66 by 1/2 to 1 inch.....6.10
66 to 68 by 1/2 to 1 inch.....6.20
68 to 70 by 1/2 to 1 inch.....6.30
70 to 72 by 1/2 to 1 inch.....6.40
72 to 74 by 1/2 to 1 inch.....6.50
74 to 76 by 1/2 to 1 inch.....6.60
76 to 78 by 1/2 to 1 inch.....6.70
78 to 80 by 1/2 to 1 inch.....6.80
80 to 82 by 1/2 to 1 inch.....6.90
82 to 84 by 1/2 to 1 inch.....7.00
84 to 86 by 1/2 to 1 inch.....7.10
86 to 88 by 1/2 to 1 inch.....7.20
88 to 90 by 1/2 to 1 inch.....7.30
90 to 92 by 1/2 to 1 inch.....7.40
92 to 94 by 1/2 to 1 inch.....7.50
94 to 96 by 1/2 to 1 inch.....7.60
96 to 98 by 1/2 to 1 inch.....7.70
98 to 100 by 1/2 to 1 inch.....7.80

Heavy Bands.
3 1/2 to 6 by 1/2 to 1 inch.....3.20
6 to 8 by 1/2 to 1 inch.....3.30
8 to 10 by 1/2 to 1 inch.....3.40
10 to 12 by 1/2 to 1 inch.....3.50
12 to 14 by 1/2 to 1 inch.....3.60
14 to 16 by 1/2 to 1 inch.....3.70
16 to 18 by 1/2 to 1 inch.....3.80
18 to 20 by 1/2 to 1 inch.....3.90
20 to 22 by 1/2 to 1 inch.....4.00
22 to 24 by 1/2 to 1 inch.....4.10
24 to 26 by 1/2 to 1 inch.....4.20
26 to 28 by 1/2 to 1 inch.....4.30
28 to 30 by 1/2 to 1 inch.....4.40
30 to 32 by 1/2 to 1 inch.....4.50
32 to 34 by 1/2 to 1 inch.....4.60
34 to 36 by 1/2 to 1 inch.....4.70
36 to 38 by 1/2 to 1 inch.....4.80
38 to 40 by 1/2 to 1 inch.....4.90
40 to 42 by 1/2 to 1 inch.....5.00
42 to 44 by 1/2 to 1 inch.....5.10
44 to 46 by 1/2 to 1 inch.....5.20
46 to 48 by 1/2 to 1 inch.....5.30
48 to 50 by 1/2 to 1 inch.....5.40
50 to 52 by 1/2 to 1 inch.....5.50
52 to 54 by 1/2 to 1 inch.....5.60
54 to 56 by 1/2 to 1 inch.....5.70
56 to 58 by 1/2 to 1 inch.....5.80
58 to 60 by 1/2 to 1 inch.....5.90
60 to 62 by 1/2 to 1 inch.....6.00
62 to 64 by 1/2 to 1 inch.....6.10
64 to 66 by 1/2 to 1 inch.....6.20
66 to 68 by 1/2 to 1 inch.....6.30
68 to 70 by 1/2 to 1 inch.....6.40
70 to 72 by 1/2 to 1 inch.....6.50
72 to 74 by 1/2 to 1 inch.....6.60
74 to 76 by 1/2 to 1 inch.....6.70
76 to 78 by 1/2 to 1 inch.....6.80
78 to 80 by 1/2 to 1 inch.....6.90
80 to 82 by 1/2 to 1 inch.....7.00
82 to 84 by 1/2 to 1 inch.....7.10
84 to 86 by 1/2 to 1 inch.....7.20
86 to 88 by 1/2 to 1 inch.....7.30
88 to 90 by 1/2 to 1 inch.....7.40
90 to 92 by 1/2 to 1 inch.....7.50
92 to 94 by 1/2 to 1 inch.....7.60
94 to 96 by 1/2 to 1 inch.....7.70
96 to 98 by 1/2 to 1 inch.....7.80
98 to 100 by 1/2 to 1 inch.....7.90

Light Bands.
3 to 6 by 1/2 to 1 inch.....3.00
6 to 8 by 1/2 to 1 inch.....3.10
8 to 10 by 1/2 to 1 inch.....3.20
10 to 12 by 1/2 to 1 inch.....3.30
12 to 14 by 1/2 to 1 inch.....3.40
14 to 16 by 1/2 to 1 inch.....3.50
16 to 18 by 1/2 to 1 inch.....3.60
18 to 20 by 1/2 to 1 inch.....3.70
20 to 22 by 1/2 to 1 inch.....3.80
22 to 24 by 1/2 to 1 inch.....3.90
24 to 26 by 1/2 to 1 inch.....4.00
26 to 28 by 1/2 to 1 inch.....4.10
28 to 30 by 1/2 to 1 inch.....4.20
30 to 32 by 1/2 to 1 inch.....4.30
32 to 34 by 1/2 to 1 inch.....4.40
34 to 36 by 1/2 to 1 inch.....4.50
36 to 38 by 1/2 to 1 inch.....4.60
38 to 40 by 1/2 to 1 inch.....4.70
40 to 42 by 1/2 to 1 inch.....4.80
42 to 44 by 1/2 to 1 inch.....4.90
44 to 46 by 1/2 to 1 inch.....5.00
46 to 48 by 1/2 to 1 inch.....5.10
48 to 50 by 1/2 to 1 inch.....5.20
50 to 52 by 1/2 to 1 inch.....5.30
52 to 54 by 1/2 to 1 inch.....5.40
54 to 56 by 1/2 to 1 inch.....5.50
56 to 58 by 1/2 to 1 inch.....5.60
58 to 60 by 1/2 to 1 inch.....5.70
60 to 62 by 1/2 to 1 inch.....5.80
62 to 64 by 1/2 to 1 inch.....5.90
64 to 66 by 1/2 to 1 inch.....6.00
66 to 68 by 1/2 to 1 inch.....6.10
68 to 70 by 1/2 to 1 inch.....6.20
70 to 72 by 1/2 to 1 inch.....6.30
72 to 74 by 1/2 to 1 inch.....6.40
74 to 76 by 1/2 to 1 inch.....6.50
76 to 78 by 1/2 to 1 inch.....6.60
78 to 80 by 1/2 to 1 inch.....6.70
80 to 82 by 1/2 to 1 inch.....6.80
82 to 84 by 1/2 to 1 inch.....6.90
84 to 86 by 1/2 to 1 inch.....7.00
86 to 88 by 1/2 to 1 inch.....7.10
88 to 90 by 1/2 to 1 inch.....7.20
90 to 92 by 1/2 to 1 inch.....7.30
92 to 94 by 1/2 to 1 inch.....7.40
94 to 96 by 1/2 to 1 inch.....7.50
96 to 98 by 1/2 to 1 inch.....7.60
98 to 100 by 1/2 to 1 inch.....7.70

Round and Square.
1 to 1 1/2.....3.00
1 1/2 to 2.....3.10
2 to 2 1/2.....3.20
2 1/2 to 3.....3.30
3 to 3 1/2.....3.40
3 1/2 to 4.....3.50
4 to 4 1/2.....3.60
4 1/2 to 5.....3.70
5 to 5 1/2.....3.80
5 1/2 to 6.....3.90
6 to 6 1/2.....4.00
6 1/2 to 7.....4.10
7 to 7 1/2.....4.20
7 1/2 to 8.....4.30
8 to 8 1/2.....4.40
8 1/2 to 9.....4.50
9 to 9 1/2.....4.60
9 1/2 to 10.....4.70
10 to 10 1/2.....4.80
10 1/2 to 11.....4.90
11 to 11 1/2.....5.00
11 1/2 to 12.....5.10
12 to 12 1/2.....5.20
12 1/2 to 13.....5.30
13 to 13 1/2.....5.40
13 1/2 to 14.....5.50
14 to 14 1/2.....5.60
14 1/2 to 15.....5.70
15 to 15 1/2.....5.80
15 1/2 to 16.....5.90
16 to 16 1/2.....6.00
16 1/2 to 17.....6.10
17 to 17 1/2.....6.20
17 1/2 to 18.....6.30
1

ICE CHAIN.



We are prepared to furnish promptly all kinds of

Flat Link Chains.

We have a book showing too different sizes of Links, which will be sent upon application.

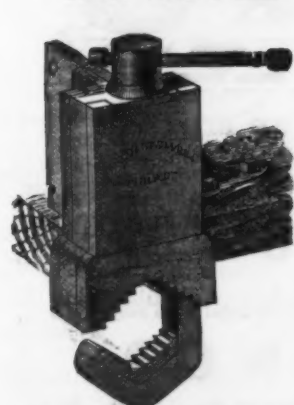
Providence Tool Co.,
PROVIDENCE, R. I.

Boston Agency,
13 & 15 Pearl St.
J. H. WORK.

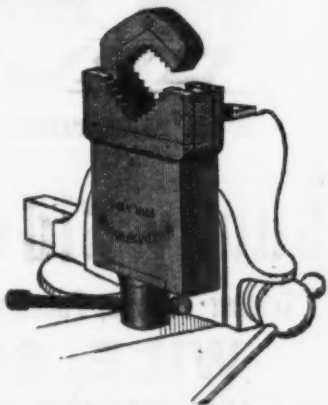
New York Agency,
11 Warren Street,
HENRY B. NEWHALL.

Chicago Agency,
163 & 165 Lake
S. H. & E. Y. MOORE.

IMPROVED PIPE-FITTERS' VISE.



STRONG,
LIGHT,
EFFICIENT,
CHEAP.



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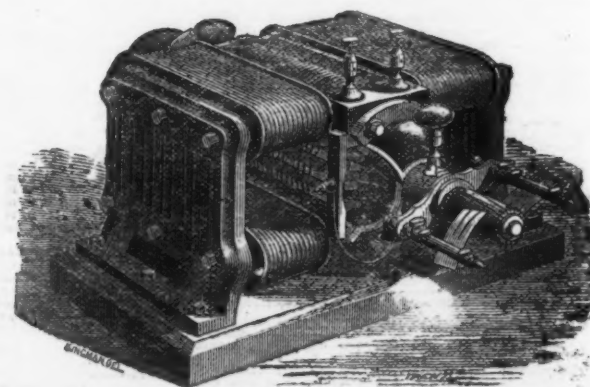
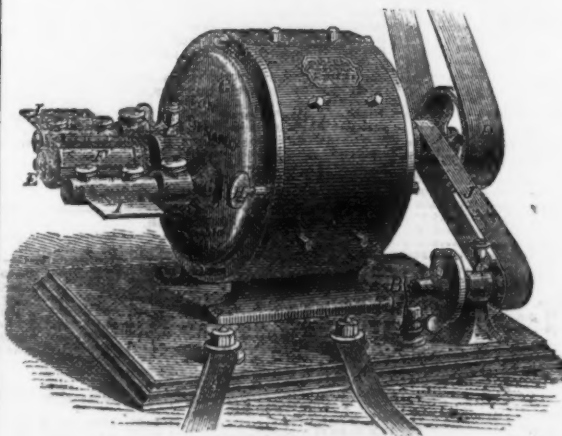
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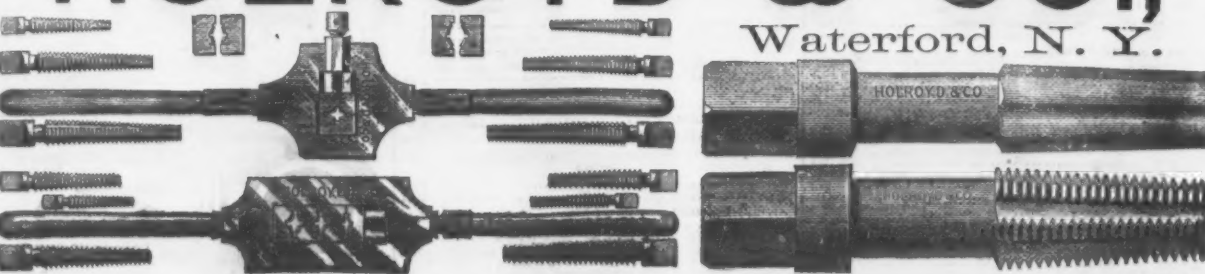
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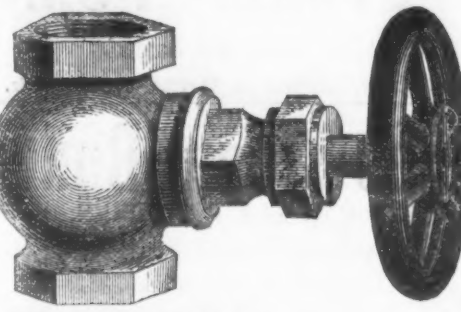


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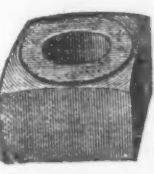

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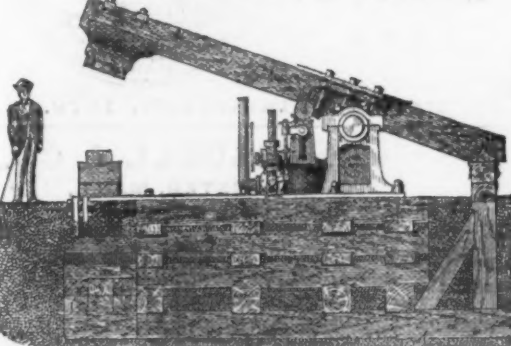


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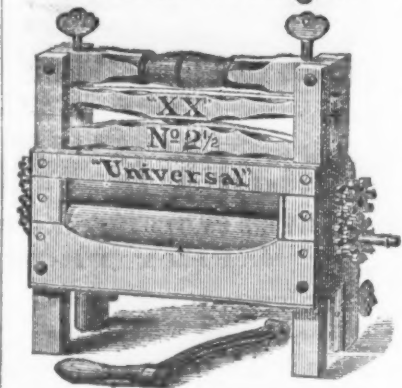

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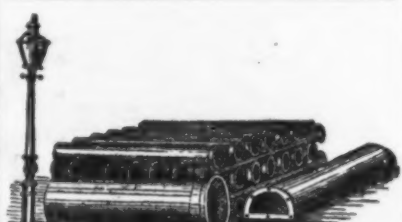
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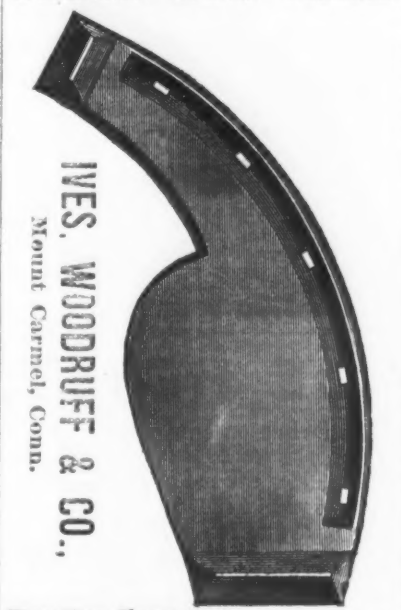
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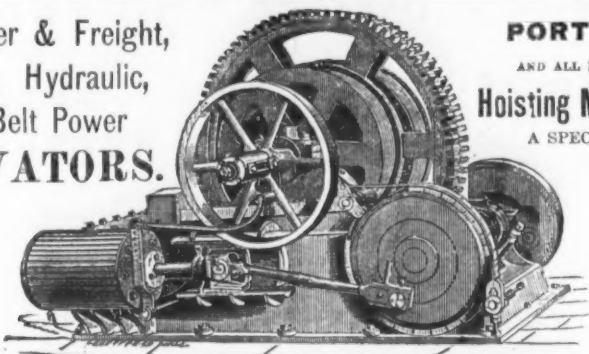
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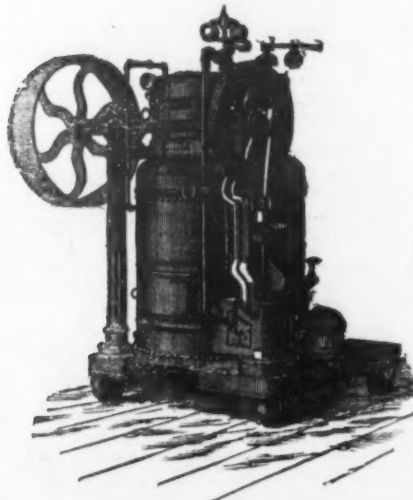
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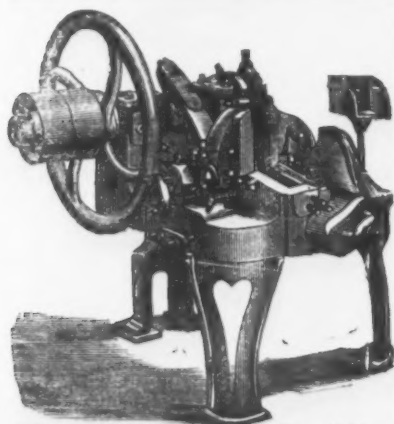
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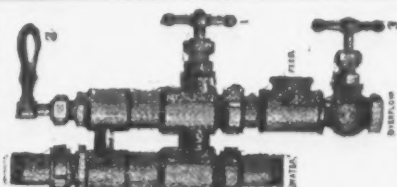
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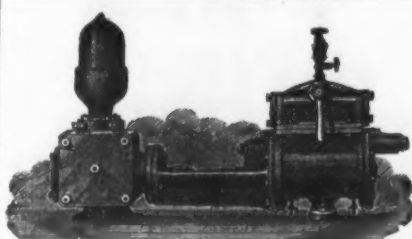


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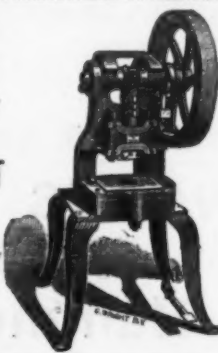
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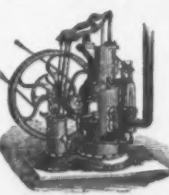


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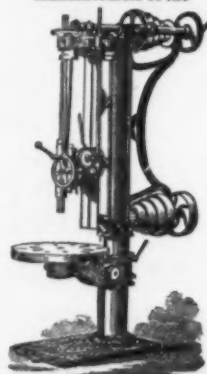
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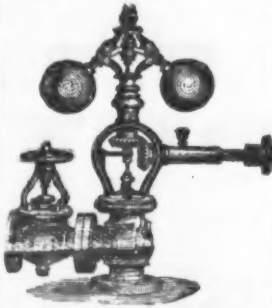
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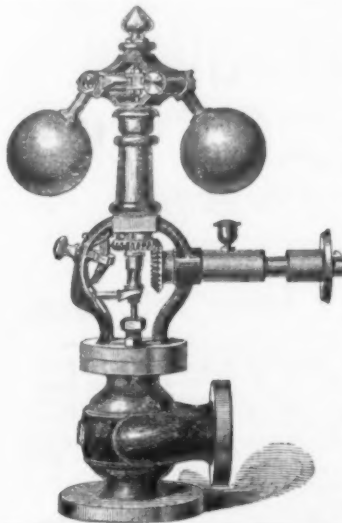
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2 1/2 in.	45.00	52.00	4.25	4.25	17.00	
3 in.	54.00	62.00	4.50	4.50	21.00	
3 1/2 in.	64.00	73.00	5.00	5.00	25.00	
4 in.	74.00	84.00	5.50	5.50	31.00	
4 1/2 in.	84.00	95.00	6.00	6.00	37.00	
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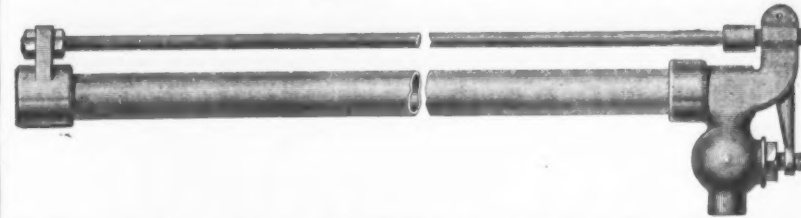
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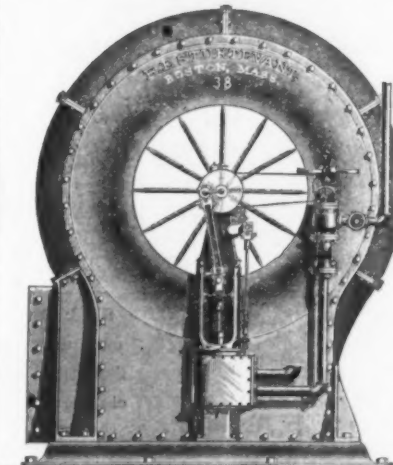
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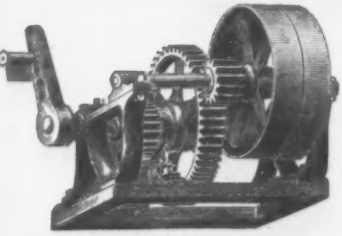
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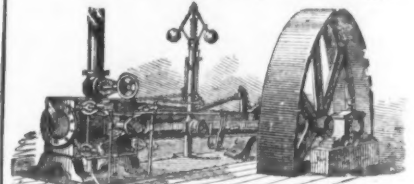
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